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AIR POLLUTION MEASUREMENTS OF THE
NATIONAL AIR SAMPLING NETWORK. ANALYSES
OF SUSPENDED PARTICLES

Robert A. Taft Sanitary Engineering Center
Cincinnati, Ohio

1965

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of the
NATIONAL AIR SAMPLING NETWORK

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1963

Air Quality Section
Laboratory of Engineering and Physical Sciences
Robert A. Taft Sanitary Engineering Center

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U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
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Division of Air Pollution

Cincinnati, Ohio
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AIR POLLUTION MEASUREMENTS OF THE NATIONAL AIR SAMPLING NETWORK

INTRODUCTION

The National Air Sampling Network was established in 1953 and at that time included 17 urban stations. The purpose of the Network was to provide information on the nature and extent of air pollution in this country and to determine major trends in pollutant levels. Since 1957 particulate samples have been taken for at least 1 year at approximately 300 urban and nonurban locations in the 50 states and Puerto Rico. More recently, gas samplers have been operated at 50 stations to measure concentrations of sulfur dioxide and nitrogen dioxide.

Results from the Network's particulate and gas sampling stations have been published in reports covering the periods 1953-1957¹, 1957-1961², and 1962³. This report continues the policy of publication of annual reports started in 1962, and begins a new effort to examine in greater depth the significance of the data. It is hoped that these brief discussions will stimulate interest in more detailed research into the nature of air pollutants and the role they play in human ecology.

SUMMARY

In 1963 the National Air Sampling Network encompassed some 200 stations. This report presents the results of analyses performed on samples collected at these stations in 1963 and also results of analyses performed in 1963 on some samples collected in previous years. These results are tabulated in the Summary Table. Most pollutant levels are reported as geometric means (designated hereafter as 'means') for reasons discussed in Appendix A. Where it is not feasible to calculate the geometric parameters, arithmetic means are used (designated hereafter as 'averages').

The mean concentration of suspended particulates for 168 urban NASN stations in 1963 was $92 \mu\text{g}/\text{m}^3$. This level is not significantly different from the mean for the previous 2 years ($92 \mu\text{g}/\text{m}^3$ in 1961; $89 \mu\text{g}/\text{m}^3$ in 1962). Concentrations in individual samples ranged from a minimum of $5 \mu\text{g}/\text{m}^3$ to a maximum of $710 \mu\text{g}/\text{m}^3$. The mean concentration of benzene-soluble organics at urban stations was $6.5 \mu\text{g}/\text{m}^3$; this level also has changed little from the previous 2 years ($6.9 \mu\text{g}/\text{m}^3$ in 1961; $6.6 \mu\text{g}/\text{m}^3$ in 1962). Concentrations in individual samples ranged from $0.2 \mu\text{g}/\text{m}^3$ to $128.3 \mu\text{g}/\text{m}^3$.

The mean concentration of suspended particulates for the 32 nonurban stations was $27 \mu\text{g}/\text{m}^3$, a level that has not fluctuated significantly in the past 6 years. Concentrations in individual nonurban samples ranged from $1 \mu\text{g}/\text{m}^3$ to $843 \mu\text{g}/\text{m}^3$. Note that the nonurban maximum exceeded that for the urban sampling stations. This anomaly is discussed later (Strong, Dry Winds).

Analysis of data on particulate pollutants in 100 selected cities, (See Part 2) for the period from 1957 through 1963, shows that concentrations of most of the individual particulate pollutants analyzed are related to the concentration of total suspended particulates. Benzene-soluble organic matter averages about 7-1/2% of urban particulates. The sulfates average about 10%, iron a little over 3%, and lead less than 1% of the suspended particulates in those cities for which data are available. Nitrate concentrations are an exception, showing little apparent relationship to the concentration of total suspended particulates and averaging between 1 and $3 \mu\text{g}/\text{m}^3$.

A limited investigation was made of arsenic concentrations in samples from 10 selected urban stations and 2 nonurban stations. Typical concentrations were on the order of $0.02 \mu\text{g}/\text{m}^3$. Concentrations in individual urban samples ranged from less than $0.01 \mu\text{g}/\text{m}^3$, the threshold of detectability, to $1.00 \mu\text{g}/\text{m}^3$. The maximum arsenic concentration for an individual nonurban sample was $0.03 \mu\text{g}/\text{m}^3$.

SUMMARY TABLE OF ANALYTICAL RESULTS

Urban:	Number of Stations	Concentration $\mu\text{g}/\text{m}^3$, unless noted		
		Min	Max	Mean
Particulates	168	5	710	92.
Organics (Benzene-Soluble)	146	0.2	128.3	6.5
Nitrates ^a	23	0.1	18.2	1.8
Sulfates ^a	23	0.8	76.2	10.1
Nitrogen Dioxide	31	0.01 ppm	0.14 ppm	0.05 ^c ppm
Sulfur Dioxide	31	<0.01 ppm	0.38 ppm	0.03 ^c ppm
Arsenic ^a	12	<0.01	1.00	0.02
Chromium ^a	12	<0.006 ^b	0.430	0.013
Copper ^a	12	0.01	9.30	0.06
Iron ^a	12	0.3	29.0	1.9
Lead ^a	12	0.1	17.0	0.8
Manganese ^a	12	<0.01 ^b	2.30	0.07
Nickel ^a	12	<0.006 ^b	0.330	0.028
Tin ^a	12	<0.01 ^b	0.76	0.02
Titanium ^a	12	<0.01 ^b	0.49	0.03
Vanadium ^a	12	<0.003 ^b	1.000	0.019
Zinc ^a	12	<0.01 ^b	17.00	0.23
Nonurban:				
Particulates	32	1	843	27.
Nitrates ^a	11	<0.1 ^b	9.5	0.6
Sulfates ^a	11	<0.1 ^b	23.1	3.8

^aIncludes analyses performed on samples collected prior to 1963

^bMinimum detectable quantity

^cArithmetic Mean

PART 1: NETWORK OPERATION AND ANALYSIS IN 1963

THE 1963 NETWORK

During 1963, the National Air Sampling Network consisted of 168 urban and 32 nonurban sampling locations (Figure 1-1). Each of these stations was equipped with a high-volume air sampler to determine the concentration of suspended particulate matter in the atmosphere. In addition, 48 of the urban stations were equipped with gas samplers to determine ambient levels of nitrogen dioxide and sulfur dioxide.



Figure 1-1. National Air Sampling Network - 1963.

As in the 1962 report, this report includes data from various state-operated air sampling networks. Permission for such inclusions has thus far been obtained from the State Departments of Health of Maryland (4 stations), North Carolina (2 stations), Texas (9 stations), New York (8 stations), and Washington (5 stations). The locations of these stations are shown in Figure 1-2.

In past years, an individual, bi-weekly, random sampling schedule was prepared for each station. In 1963, all stations sampled on the same schedule, thus greatly facilitating the comparison of air pollution levels with synoptic meteorological information. This comparison is most important when a sampling date happens to occur during a period of atmospheric stagnation. Such a situation, which included the June 25 sampling date, is discussed in detail under Atmospheric Stagnation.

In 1963, the following were the specified starting dates for the 24-hour sampling periods:

January 2, 19	July 8, 19, 31
February 2, 14, 26	August 18, 29
March 14, 29	September 10, 28
April 14, 29	October 10, 28
May 9, 21	November 5, 22
June 6, 24	December 9, 18

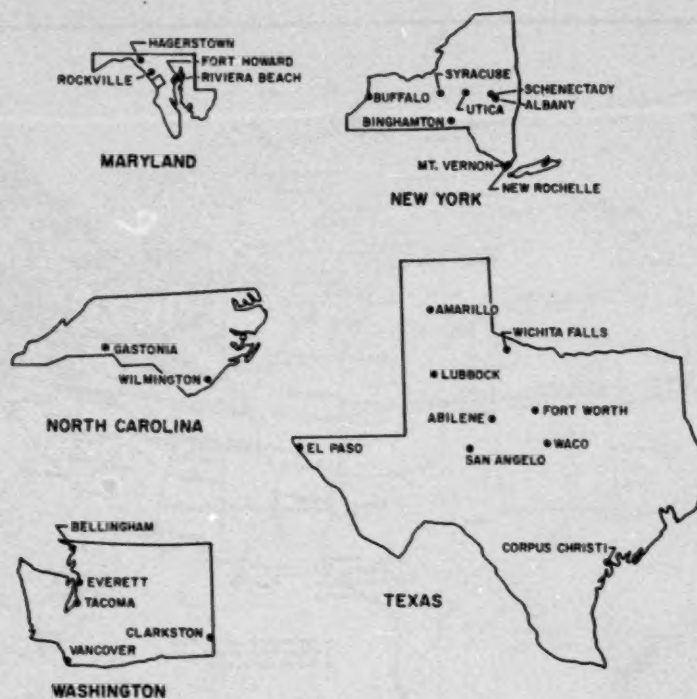


Figure I-2. Contributing state network stations - 1963.

SAMPLING AND ANALYSIS

The basic NASN measurement is the weight of suspended particulates collected by drawing a measured quantity of air through a glass-fiber filter for 24 hours. This information is then reduced to a weight of suspended particulates per unit volume of air, reported here as micrograms per cubic meter ($\mu\text{g}/\text{m}^3$).

The Division of Radiological Health determines the gross beta radioactivity of each sample, the results of which are reported as picocuries (10^{-12} curies) per cubic meter (pc/m^3). The results are published quarterly* and are summarized in Data Table 3-9 (Part 3).

*"Radiological Health Data" published quarterly by the Division of Radiological Health, Public Health Service.

After completion of these physical measurements, the sample is divided as shown in Figure 1-3 for one or more chemical analyses. All samples are analyzed for benzene-soluble organic matter. When further information on the composition of particulates would be of interest, samples may be analyzed for nitrates and sulfates by wet chemical methods, and for antimony, arsenic, beryllium, bismuth, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, tin, titanium, vanadium, and zinc by emission spectrometry.

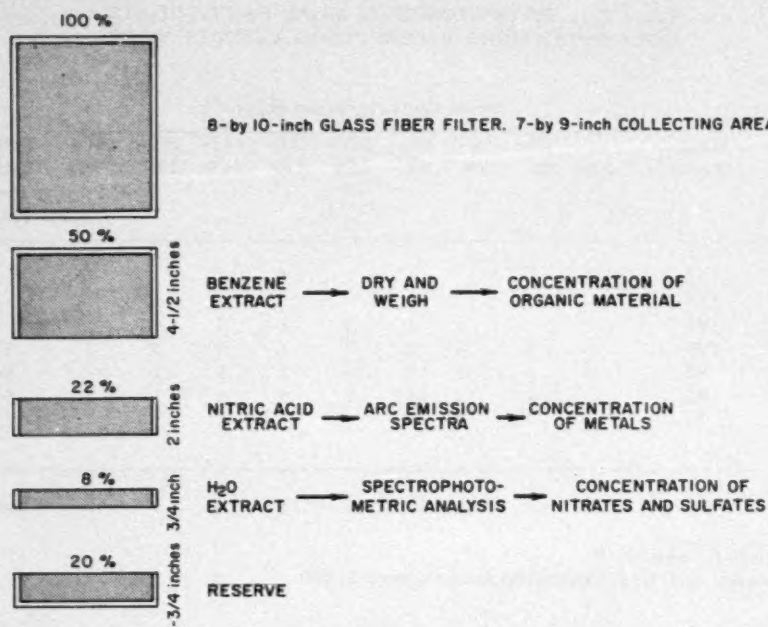


Figure 1-3. Division of sample for detailed analysis - collected sample is weighed and monitored for gross beta radioactivity, then divided for organic and other analyses as required.

Remaining portions of the samples are filed for possible later use. A detailed description of the particulate analytical methods is included in a previous publication.²

A limited investigation for the presence of arsenic was conducted for the first time in 1963. Samples were analyzed from 12 stations selected to represent a broad range of locations, both urban and nonurban.

Measurements of nitrogen dioxide and sulfur dioxide are made by analysis of samples obtained by bubbling air through reagent solutions capable of capturing these pollutants. Their concentrations are reported as parts per million (ppm). The details of the sampling and analysis of these gaseous pollutants have been previously described.⁴

SUSPENDED PARTICULATES AND POPULATION

The cities participating in the NASN have been grouped into seven population classes. Frequency distributions of the mean concentrations of suspended particulates for the cities in each class are presented in Table 1-1. A positive relationship between size of cities and concentrations of suspended particulates is indicated, as shown in Figure 1-4.

The relationship between city size and particulate pollution levels tends to become ob-

scured in the smaller sized groups. This may be attributable to the fact that for populations below 400,000 the percentage of cities included in the Network rapidly diminishes. Also the smaller cities chosen to be included in the Network tend to be those where air pollution problems are known to exist. The wide range of means within a population class demonstrates the effect of some of the modifying influences that cause higher concentrations of suspended particulates in some cities than would have been expected on the basis of population alone.

Table 1-1. DISTRIBUTION OF MEAN PARTICULATE CONCENTRATIONS WITHIN POPULATION CLASSES

Population Class	Mean ($\mu\text{g}/\text{m}^3$)	Mean Concentration ($\mu\text{g}/\text{m}^3$)									Total Cities 1963	Total Cities U. S. NASN
		>40	40-59	60-79	80-99	100-119	120-139	140-159	160-179	180-199		
>3 million	162						1			1	2	2
1-3 million	125					2		1			3	3
0.7-1 million	105			1	1	3	1	1			7	7
400-700,000	106		1	4	2	5	1	1	3	1	18	19 ^a
100-400,000	93	1	4	15	17	16	5	5	1		64	100
50-100,000	92		4	14	15	6	5	5	1	1	51	180
<50,000	76		7	7	7	1		1			23	5453 ^b
All Urban	92	1	16	41	42	33	13	14	5	3	168	5764

^aIncluding San Juan, P.R.

^bIncorporated and unincorporated areas above 2,500.

In each of the seven population classes in Table 1-1, at least one city reported a mean concentration in excess of $140 \mu\text{g}/\text{m}^3$. The smallest of these communities, located in a west coast state, has a population of less than 10,000. In this community, and at least two others in the Network reporting relatively high means, the relationship between community size and concentrations of suspended particulates is probably biased by the fact that each of these communities is part of a larger urban complex.

HIGH CONCENTRATIONS OF PARTICULATE POLLUTION RELATED TO METEOROLOGICAL CONDITIONS

Periodically, the concentrations of suspended particulates in the atmosphere of a community may be unusually high compared to normal levels. The majority of these high particulate concentrations are associated with one of two meteorological conditions: (1) atmospheric stagnation, or (2) strong, dry winds.

Atmospheric Stagnation

Meteorologists at the U. S. Weather Bureau Research Station at the Robert A. Taft Sanitary Engineering Center in Cincinnati issue forecasts to all first-order Weather Bureau stations of extended periods of restricted natural ventilation. These periods, called stagnations, provide a potential for the accumulation of pollutants and warrant the issuance of an advisory to this effect.* Before an air pollution potential advisory is issued, there must be

*Any public agency or private firm concerned with air pollution or its measurement may request their local Weather Bureau office for notification of beginning and termination of air pollution potential advisories.

evidence that meteorological conditions are such that for the ensuing 36-hour period the ability of the atmosphere to disperse pollutants in both the horizontal and vertical directions is restricted, i. e., low surface winds plus limited vertical convection.⁵

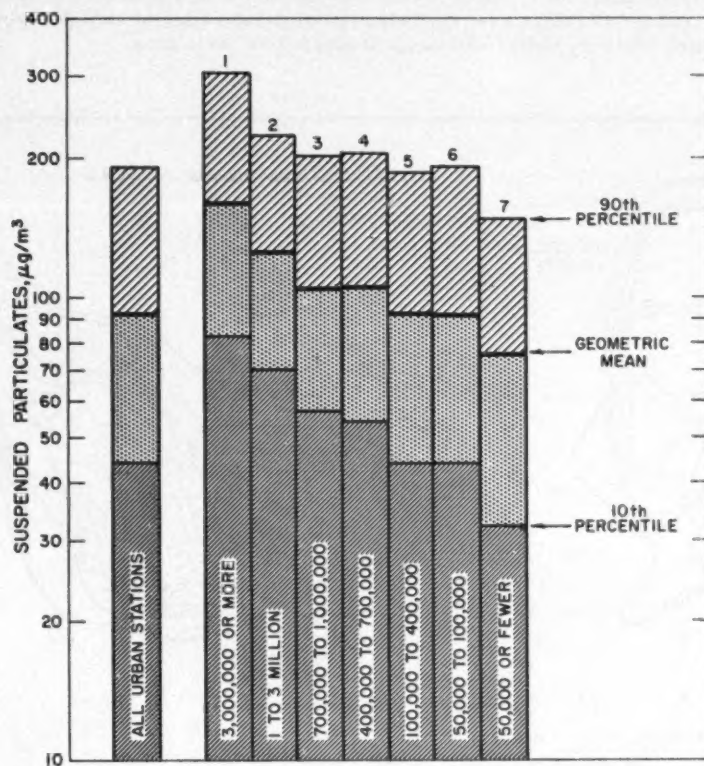


Figure 1-4. Concentrations of suspended particulates for population classes - 1963.

The map in Figure 1-5 is a composite showing the total number of days during which stagnation conditions occurred in 1963. The areas of maximum days of air pollution potential forecast are primarily centered in the Appalachian mountain region from West Virginia to Northern Georgia and Alabama and in the western mountain and coastal states.

Analysis of an Episode: June, 1963. The following example illustrates the increase in pollution levels that can occur in an area covered by a stagnating air mass. On June 24, 1963, a high-pressure system moved over the lower Great Lakes and upper Ohio River valley. By noon on June 24, it became evident that the meteorological conditions that define a stagnation condition would probably persist. On this basis, an air pollution potential advisory was issued. Weather Bureau stations in the area of concern notified interested parties, both public and private, of the potential for the buildup of pollutants.

Through June 25 (the date on which the 24-hour NASN sampling period concluded), this air mass stagnated over the region approximated by the boundaries shown in Figure 1-6. The numbers on this figure show the concentrations of particulates for June 25 as percentages above or below a station's seasonal (June, July, August) average. The concentrations within the stagnation region averaged about 58% above the seasonal normal; concentrations at the other stations, outside the boundary, averaged about 17% above normal.

By June 26, conditions had improved in the northern portion of the region, and the affected area was reduced by about one-half. The southern half of the area remained on the daily advisory until June 28.

To more clearly define the elevated levels that can occur in a community during a stagnation, NASN station operators are now being asked to take special samples when an air pollution potential advisory indicates such a stagnation in their area.

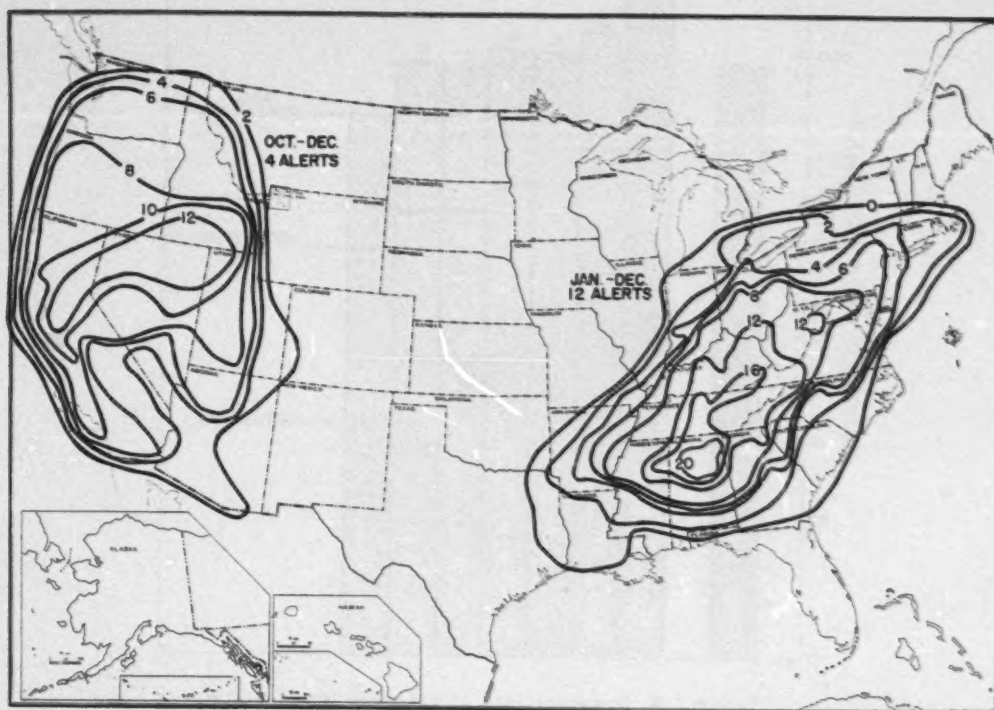


Figure 1-5. Total days air pollution potential forecasts were in effect during 1963.

Strong, Dry Winds

Strong, dry winds produced very high levels of suspended particulates in North Dakota on March 30, 1963. The concentration of $843 \mu\text{g}/\text{m}^3$ recorded on that date for the nonurban station at Ward County, North Dakota, exceeded the maximum urban concentration in 1963, $710 \mu\text{g}/\text{m}^3$. Sampling stations to the south as far as Kansas and eastward into Ohio also recorded high levels of suspended particulates on March 30 (see Figure 1-7). At 23 of the 35 stations in 12 north central states that sampled on March 30, maximums for the year were recorded on this date. Where these March 30 levels were not the highest, they were usually exceeded only by those of samples taken during the stagnation on June 25 or during another windy period, October 11.

While both stagnations and strong, dry winds seem capable of creating abnormally high levels of particulate pollution, during a stagnation condition the particulates measured originate from a wide spectrum of both natural and man made sources, principally the latter. The strong dry wind, on the other hand, contributes by raising dust from construction sites and outlying

cultivated areas, and re-entraining settled particles from streets and paved areas. As indicated by the value from the nonurban station in North Dakota, the air coming into a community may bring with it an unusually high background level of suspended particulates.



Figure 1-6. Effect of atmospheric stagnation on particulate concentrations on June 25, 1963 (percent difference from seasonal normal).



Figure 1-7. Effect of strong dry winds on particulate concentrations on March 30, 1963 (percent difference from seasonal normal - underlined values are for nonurban stations).

PART 2: TRENDS AND CORRELATIONS

TREND IN SUSPENDED PARTICULATE CONCENTRATIONS (1957-1963)

One of the purposes of the NASN is the detection of significant trends in air pollution levels. On a national scale, the levels of particulate pollution are best compared on a year-to-year basis. The annual mean concentrations of suspended particulates are shown in Figure 2-1 for all urban Network stations reporting in a given year, and for a selected number of urban Network stations (64*), which have sampled essentially every year during the period 1957-1963.

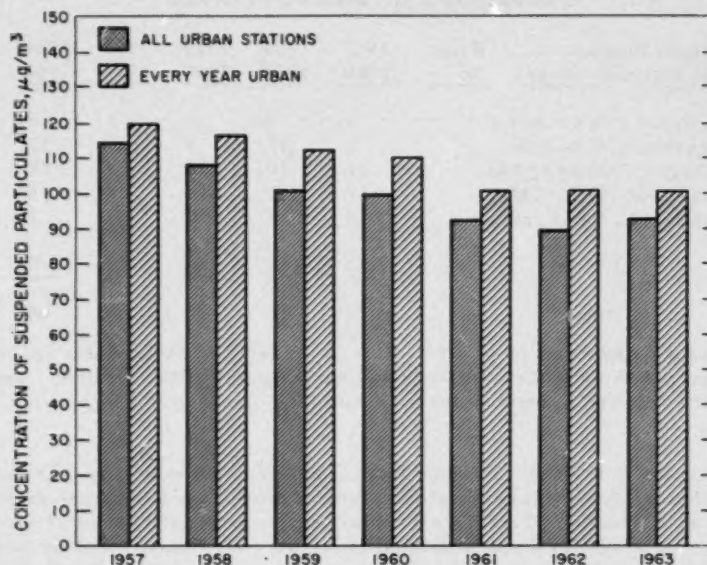


Figure 2-1. Annual geometric mean concentrations of suspended particulates at urban stations.

It is evident that each group of cities has undergone a change in the level of particulate pollution over the 7-year period. The mean for the 'all-urban' group declined steadily over the first 3 years, leveled off in 1960, and then dropped to a new level of 92 $\mu\text{g}/\text{m}^3$ in 1961. Little or no change was observed in 1962 and 1963.

The decline in the mean value for the 'all-urban' group in the first 2 years mainly reflects the changing composition of the Network. Early in the program, stations were established predominantly in the most populous cities and, as shown in Figure 1-4, the larger cities tend to incur higher pollution levels. As the Network expanded to encompass a more representative sampling of smaller and cleaner communities the annual mean dropped.

The fixed group of 'every-year' stations followed a similar pattern, dropping in 1959 and to a greater extent in 1961. This picture of the trend for the 'every-year' stations differs somewhat from that originally described in the 1957-1961 summary of data.² In that publication the annual mean for the 'every-year' stations was depicted as remaining essentially constant from 1957 through 1961. The investigation of the reasons for the decline indicated that the original annual means for the group of 59 'every-year' stations were in error, and that the decline actually was spread over at least 3 years, beginning in 1959. The revision of the 'every-year' list to include a total of 64 stations modified some of the annual means slightly but did not alter the overall trend.

*Identified in Station Inventory, Appendix 3

The trend of the mean for the 'every-year' group indicates a relatively smooth transition to the lower annual level. The trend for this selected group is generally consistent with the trend for the Network as a whole. The 5% decline from the 1957-1958 mean level to the 1959-1960 mean level and the 8% decline from the mean level for 1959-1960 to the mean level for 1961 through 1963 are statistically significant.*

Although not all of the 'every-year' stations experienced a decline in 1961, the decreases outweighed the increases. Table 2-1 summarizes the distribution of year-to-year changes in particulate levels at the 'every-year' stations and shows the large number of decreases that occurred in 1961.

Table 2-1. DISTRIBUTION OF CITIES BY YEAR-TO-YEAR CHANGES IN PARTICULATE LEVELS

Percent Change from Previous Year	From To	1957 1958	1958 1959	1959 1960	1960 1961	1961 1962	1962 1963
Increased 25% or more		4	4	4	1	8	3
Increased 10% to 24%		9	12	9	11	13	18
No Major Change ($\pm 9\%$)		21	20	32	23	28	26
Decreased 10% to 24%		17	15	14	22	14	16
Decreased 25% or more		3	6	3	9	3	3
No Data		12	9	4	0	0	0
Total		66	66	66	66	66	66

A search for an explanation of the decline in the level of particulates for the 'every-year' group of stations indicates that no single factor can account for the decline. Among the factors investigated were changes in meteorology, in sampling or analytical techniques, and in environmental factors.

Meteorologists in the U.S. Weather Bureau Research Station at the Sanitary Engineering Center report that no unusual large-scale departures from normal weather patterns occurred during the period 1959-1961. This does not preclude the possibility of local meteorological anomalies having affected levels in individual cities but does indicate that no large-scale meteorological phenomena were responsible. Further strength is added to this conclusion by the fact that the cities where levels changed were distributed randomly across the country.

If a change in sampling or analytical technique had been responsible for the shift in the average urban level, the change would have had a similar effect on the nonurban average, since all samples are processed in the same way. However, the average of some 20 'every-year' nonurban stations has not changed significantly since 1957 (Figure 2-2). A comparison of NASN samples with parallel samples, independently analyzed, taken at two stations also demonstrated the integrity of the methods employed.

The remaining alternative is that distinct changes must have occurred in the emission of particulates in the vicinity of those stations for which significant drops in annual mean were reported. Telephone inquiries to the operators of the 'every-year' stations did turn up a number of situations in which the reduced particulate level appeared to be related to one or more of the following factors.

1. Increased effectiveness of the local air pollution control program.
2. Basic changes in the pattern of fuel consumption for space heating, industrial uses, and power generation.
3. Demolition and construction associated with urban renewal or expressway projects.

*The probability of the apparent drop in average particulate level being due to the normal variability of the data is less than 1 in 100 as assessed by the student's "t" test.

Urban renewal or expressway projects could produce an initial drop as residences and industrial sites are abandoned, followed by an increase as demolition, renovation, and construction get under way. Levels have been observed to drop again with the conclusion of this phase, perhaps even below levels recorded prior to the start of the project because a number of sources have been eliminated.

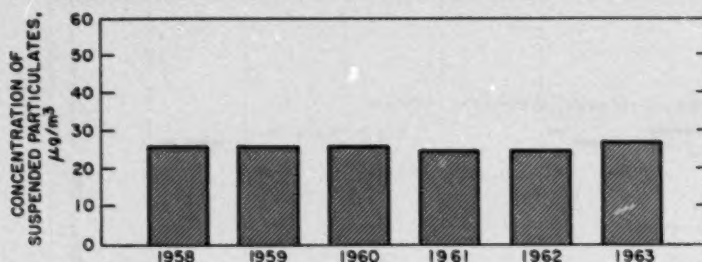


Figure 2-2. Annual geometric mean concentrations of suspended particulates at nonurban stations.

Statistically significant ($p < 0.10$) decreases in annual mean suspended particulate concentrations occurred at 19 'every-year' stations from 1960 to 1961. One or more of the above environmental factors were reported as having exerted a probable influence on the sample concentrations at 8 of these stations. Together, these 8 stations accounted for approximately half of the total decrease for the 19 stations. The decreases at the remainder of the stations must be attributed to coincidence or possibly to the combined influence of a number of minor factors that, individually, have not been recognized as significant.

TREND IN RADIOACTIVITY (1957-1963)

Generally, the radioactive particulates in the atmosphere are due to nuclear testing. Since this contaminant is chiefly distributed from the upper levels of the atmosphere over town and country alike, both urban and nonurban data are combined in the monthly national averages plotted in Figure 2-3. The major periods in the history of nuclear testing in the atmosphere are noted on the figure. Each period of testing is associated with increased levels of radioactivity in the NASN samples. During the period of extensive testing at the Nevada site in 1957, the national average level reached a peak of 35 pc/m^3 . Less intensive testing in Nevada and the remote locations of other tests by this country and others have resulted in lower subsequent peaks. Levels dropped to near zero during 1959 and 1960, and into 1961. The resumption of atmospheric testing during the summer of 1961 resulted in a very sudden increase in the level of radioactivity.

CORRELATIONS AMONG POLLUTANTS

To explore the extent of some of the relationships among pollutants, Network cities were selected for which at least 4 years of data on particulate and organic concentrations were available in the period 1957 through 1963. Of the 4 years of data, at least 2 were required to be in the 1961-1963 period. This requirement was made to exclude data from stations that have not been in regular operation since the drop in the 'every-year' station mean for suspended particulates in 1961, discussed earlier. Exactly 100 cities meet these criteria (Table 2-2).

Requiring at least 4 years of data to generate an average assures a fairly reliable estimate of the representative levels of particulate and organic concentrations in a given location. Data from the same 100 cities were used, where available, for the comparisons with sulfates, nitrates, iron, and lead; for many locations, only 1 year's data on these constituent pollutants have been compiled.

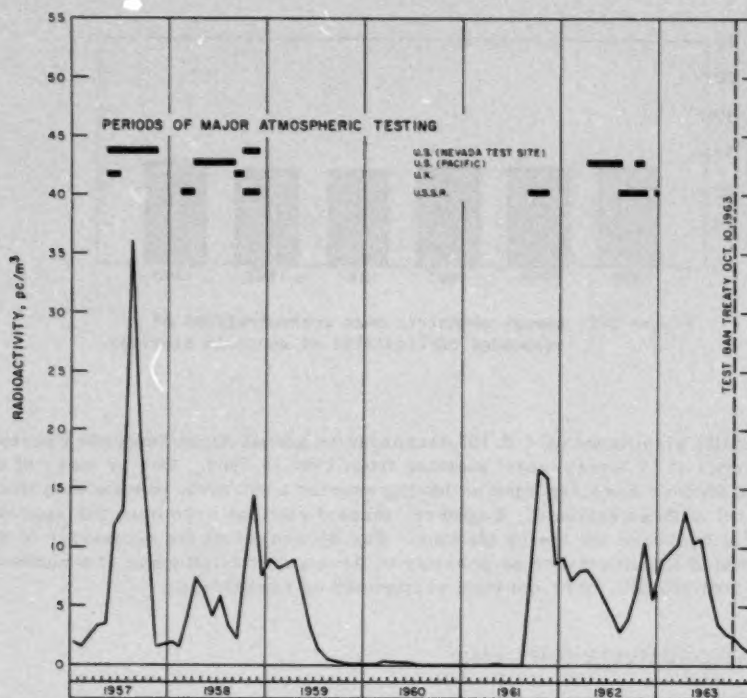


Figure 2-3. Monthly mean concentrations of beta radioactivity as related to testing of nuclear weapons.

Organics and Suspended Particulates

The average concentrations of particulate and benzene-soluble organic pollutants for each city over the years for which data were available are plotted in Figure 2-4. For the cities included in this discussion, an average of 7-1/2% of the collected material is benzene-soluble organic matter.

The local conditions that cause the relative concentrations of organics in a few locations to deviate from the general relationship are usually unique for each city. A number of the cities for which abnormally small organic fractions are reported are located in the semi-arid regions of the Southwest. The particulates in these communities are undoubtedly influenced significantly by wind-blown dust and fine sand. Samples from these locations often have a distinctive brown color in contrast to the samples from other urban areas, which are black as a result of carbonaceous material from incomplete combustion.

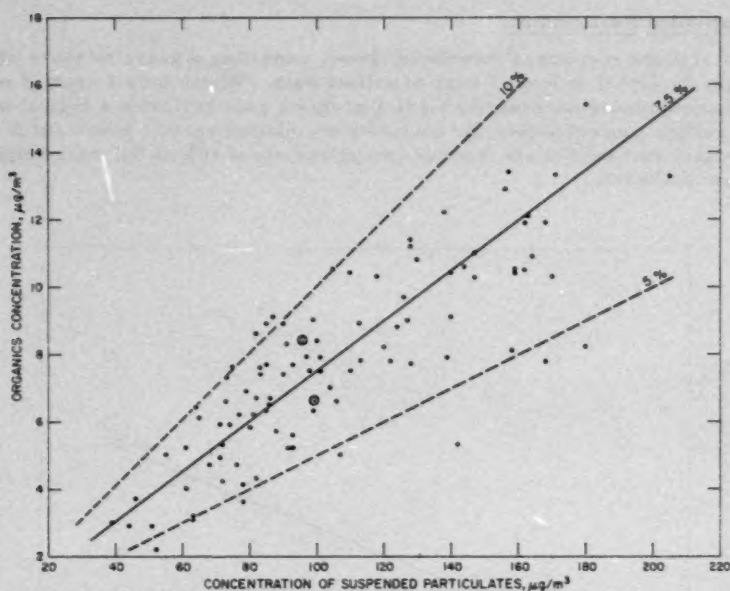


Figure 2-4. Average concentrations of benzene-soluble organics and suspended particulates in air of 100 cities during 1957 through 1963 (• indicates identical concentrations for two cities).

Table 2-2. LIST OF 100 CITIES FOR WHICH 1957-1963 DATA ARE SUMMARIZED

Alabama Birmingham	Florida Miami Tampa	Massachusetts Boston Brockton Fall River Lawrence Lynn Quincy Somerville Springfield Worcester	New Jersey Jersey City Newark	Oklahoma Oklahoma City Tulsa	Texas Corpus Chr Dallas El Paso Ft. Worth Houston San Antonio Waco
Alaska Anchorage	Georgia Atlanta		New Mexico Albuquerque	Oregon Portland	
Arizona Phoenix	Hawaii Honolulu		New York Binghamton Buffalo Elmira Glen Cove Massena New York City Rochester Syracuse Utica	Pennsylvania Philadelphia Pittsburgh Scranton	Utah Salt Lake Ci
Arkansas Little Rock	Idaho Boise	Michigan Detroit		Puerto Rico San Juan	Vermont Burlington
California Los Angeles Oakland San Bernardino San Diego San Francisco San Jose	Illinois Chicago	Minnesota Duluth Minneapolis St. Paul		Rhode Island Providence	Virginia Hampton Norfolk Richmond
	Indiana E. Chicago Indianapolis	Mississippi Jackson Troy	North Carolina Charlotte	South Carolina Columbia	Washington Seattle
Colorado Denver	Iowa Des Moines	Missouri Kansas City St. Louis	North Dakota Bismarck	South Dakota Sioux Falls	West Virginia Charleston
Connecticut Hartford New Haven	Kansas Wichita		Ohio Akron Canton Cincinnati Cleveland Columbus Dayton Toledo Youngstown	Tennessee Chattanooga Knoxville Memphis Nashville	Wisconsin Milwaukee
Delaware Wilmington	Louisiana New Orleans	Montana Helena			Wyoming Cheyenne
District of Columbia Washington	Maine Portland	Nebraska Omaha			
	Maryland Baltimore	Nevada Las Vegas			

Sulfates and Suspended Particulates

Of the 100 stations mentioned above, reporting 4 years or more of particulate and organic data, 83 report at least 1 year of sulfate data. Where only 1 year of such data is available, the assumption is necessarily made that this 1 year indicates a typical annual level. These average sulfate concentrations for each city are plotted against particulates in Figure 2-5, which indicates that the sulfate fraction comprises about 10% of the total weight of collected particulate pollutants.

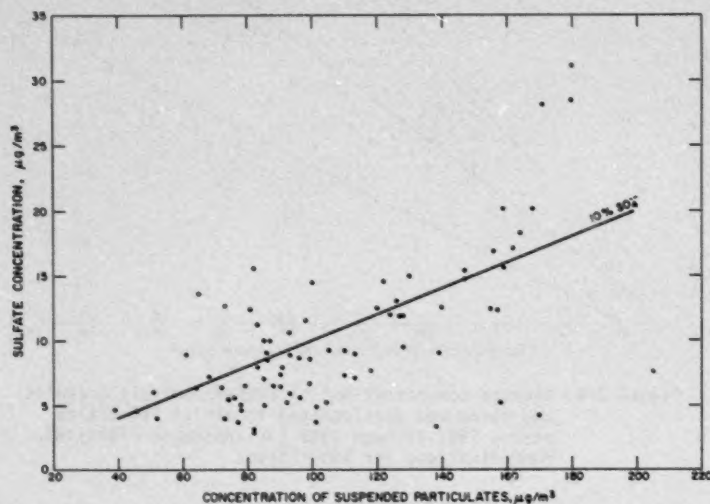


Figure 2-5. Average concentrations of sulfates and suspended particulates in air of 83 cities during 1957 through 1963.

Sulfates and Sulfur Dioxide

Concurrent data for these two pollutants are available from only 11 stations, partly because the Gas Sampling Network did not begin full operation until 1962 and partly because the schedule for completion of sulfate analyses for most stations lags the particulate and organic analyses by approximately 1 year. For this reason Figure 2-6 depicts 1962 data, and all stations reporting data have been included even though they may not be among the 100 stations included in Table 2-2.

The yearly average sulfate and sulfur dioxide concentrations* in these 11 cities are plotted in Figure 2-6. The distribution of points indicates a positive correlation between particulate sulfates and gaseous sulfur dioxide on a city-by-city basis. A similar relationship exists when these two pollutants are compared on a sample-by-sample basis for individual cities. The relationship probably results from the combination of two factors:

- 1) The conversion, in the atmosphere, of sulfur dioxide to sulfate compounds, and
- 2) The concurrent emission of both pollutants from the combustion of fuels containing sulfur.

*Note that concentrations of gaseous pollutants are tabulated on Figures 2-6 and 2-8 both in parts per million (ppm) and in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$), allowing direct comparisons with concentrations of particulate pollutants. For example, 0.06 ppm of NO_2 , a common value in Figure 2-8, is equivalent to $112 \mu\text{g}/\text{m}^3$ of NO_2 . Note that this typical concentration for a single gaseous pollutant is greater than the $92 \mu\text{g}/\text{m}^3$ mean concentration of total particulate pollutants at urban stations in 1963.

Without knowledge of the degree to which sulfur dioxide is converted to sulfate compounds it is not possible to state what portion of the sulfates are emitted directly and what portion may be the result of some conversion process.

Figure 2-6 and also the sample-by-sample comparisons within cities indicate that some sulfate compounds are found in the air even when sulfur dioxide levels approach zero.

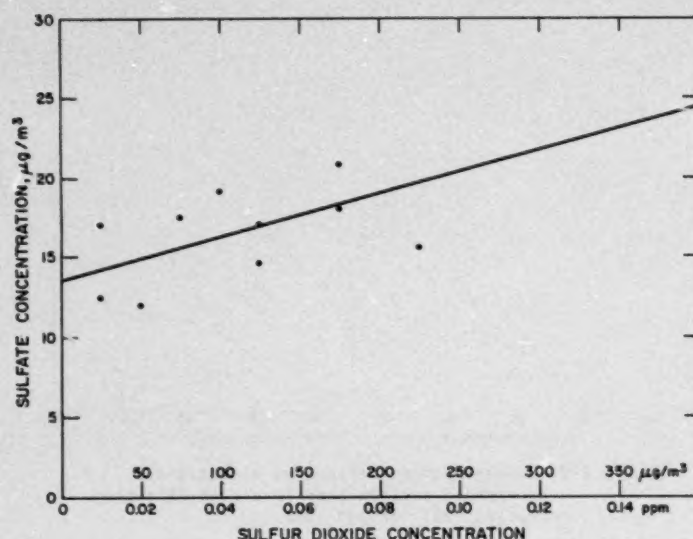


Figure 2-6. Average concentrations of sulfates and sulfur dioxide in air of 11 cities during 1962.

Nitrates and Suspended Particulates

Nitrate data for at least 1 year, and often only 1 year, were available for 81 of the 100 cities. As with the sulfate data, it was necessarily assumed that the 1 year's data represented the typical annual mean for a station. The plot of average nitrate concentration for each city against average suspended particulates (Figure 2-7) indicates no relationship between these two pollutants. The most striking feature of this plot is the tendency for the average nitrate concentrations to be less than $3 \mu\text{g}/\text{m}^3$, regardless of the concentration of suspended particulates. The exceptions, those locations that reported higher concentrations of nitrates and seem to lie apart from the other points, are two cities in a west coast state and three cities in an east coast state.

Nitrates and Nitrogen Dioxide

Concurrent, full-year data for these two pollutants are available in only 11 cities, as discussed previously. No relationship between these two pollutants is evident in the plot of yearly averages by city in Figure 2-8. Sample-by-sample comparisons within cities also suggest little correlation between concentrations of nitrates and nitrogen dioxide.

Metals and Suspended Particulates

Iron - Iron analyses have been run for at least 1 year on samples from 77 of the 100 cities. The average annual concentrations of iron for each city are plotted against concentrations of suspended particulates in Figure 2-9. The distribution of the points indicates there may be a background level of some 30 to $40 \mu\text{g}/\text{m}^3$ of suspended particulates that contain essentially no iron. Note that this approximates the level in nonurban samples. As yet, no nonurban samples have been analyzed in detail for constituent metals.

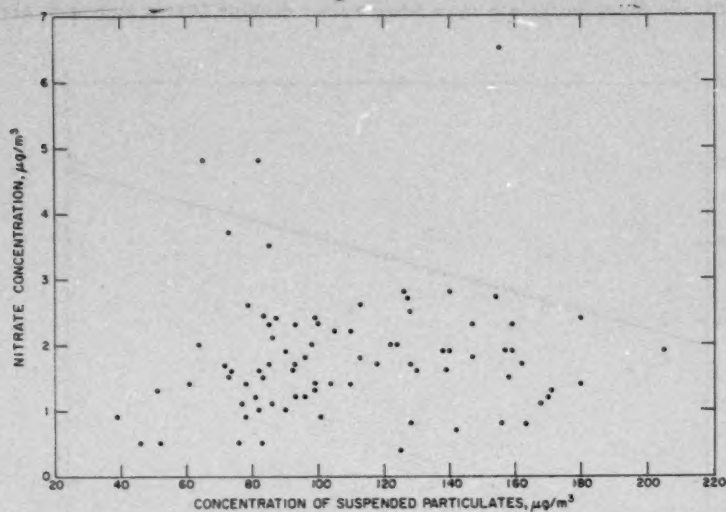


Figure 2-7. Average concentrations of nitrates and suspended particulates in air of 81 cities during 1957 through 1963.

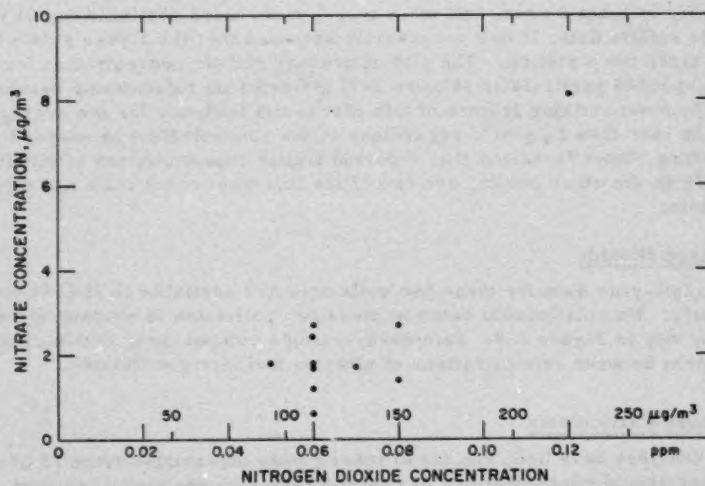


Figure 2-8. Average concentrations of nitrates and nitrogen dioxide in air of 11 cities during 1962.

Lead - Lead analyses have been run for at least 1 year on samples from 85 of the 100 cities. At most locations less than 1% of the particulate matter is lead (Figure 2-10). The 0.5% and 0.2% lines have been plotted to indicate the range. The 0.5% line falls generally through the middle of the data; the points are so scattered, however, that it would be an oversimplification to state that urban samples typically contain 0.5% lead. The percentage characteristics in Figure 2-10 have been drawn through the origin, but the distribution of the points suggests that lead concentrations may approach zero for some positive value of suspended particulates, indicating an essentially lead-free background. As with iron, no nonurban samples have been analyzed for lead to show whether naturally occurring particulates contain detectable concentrations of lead.

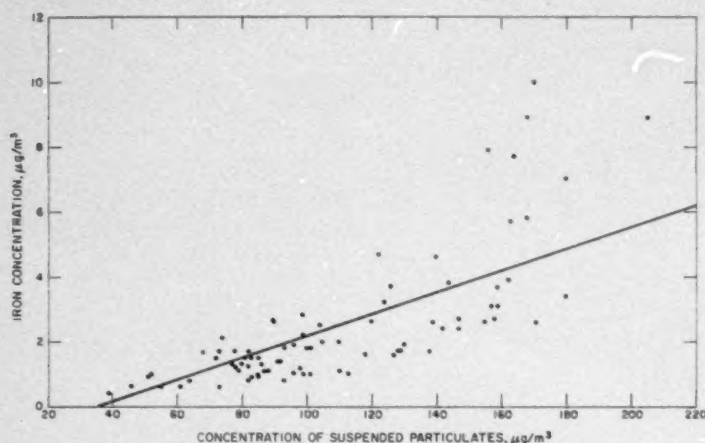


Figure 2-9. Average concentrations of iron and suspended particulates in air of 77 cities during 1957 through 1963.

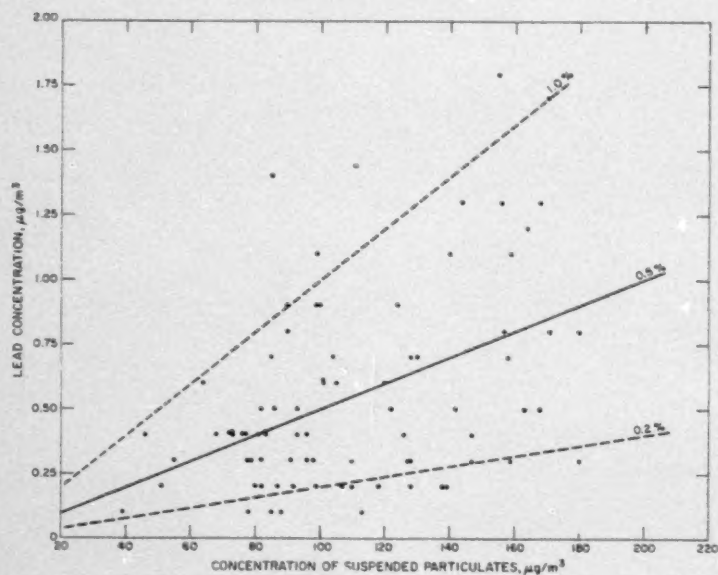


Figure 2-10. Average concentrations of lead and suspended particulates in air of 85 cities during 1957 through 1963.

PART 3: DATA TABLES

READING THE DATA TABLES

The majority of the tables are in the form of a frequency distribution that indicates how frequently samples equal to or less than a given value were recorded during the year. As an example, the distribution of particulate samples from Birmingham, Alabama (Table 3-1), was such that 90% of them were equal to, or less than, 241 micrograms per cubic meter. Conversely, 10% of the samples were greater than 241 micrograms per cubic meter. The entries on each side of the frequency distribution list the lowest and highest individual concentrations in the group of samples being summarized.

To yield a statistically reliable analysis of the sample frequency distribution, the samples submitted by a station must satisfy the following criteria:

1. A minimum of 20 samples and a maximum of 26 samples collected during a year.
2. A minimum of 10 and a maximum of 13 samples collected in each half of a year.
3. At most, 3 samples collected in any one month.
4. At most, 7 samples collected in any one quarter.
5. Samples collected during at least 2 of the 3 months in a quarter.

A number of local agencies, on their own initiative, collect more than 26 samples a year. These extra samples are weighed and analyzed in the usual manner but the data are tagged as "special" and are not included in the summarization. Such results are reported only to the station contributing the additional samples, unless they are of general interest, such as the additional samples taken in 1964 in areas experiencing stagnation conditions.

Following the full tabulations of suspended particulates and benzene-soluble organics for those urban stations meeting the criteria for statistical analysis, abbreviated tabulations (Tables 3-3 and 3-8) list the minimum and maximum concentrations and the arithmetic means for those so-called "nonqualifying" urban stations with insufficient or unevenly distributed samples in 1963.

Full-year tabulations for nitrates, sulfates, and metals are presented in Tables 3-10, 3-13, and 3-16 through 3-26, respectively. Tables 3-11, 3-14, and 3-31 through 3-41 present data on these pollutants covering the last 6 months of 1962, or the first 6 months of 1963, or both. These analyses were requested as part of a special project. Being only 6-month selections, they do not qualify for the computer analysis program and are therefore also presented in the format of minimum, maximum, and arithmetic mean. When the samples for the remainder of these years have been analyzed, regular full-year summaries will be published.

Four of the metals - antimony, bismuth, cobalt, and molybdenum - are frequently not detected in the samples. For this reason, the usual calculation of frequency distribution of sample concentrations has little meaning. For these metals, the number of analyzed samples is listed, followed by the number of samples yielding detectable amounts and the maximum concentration found.

The regional summaries included in previous tabulations of NASN data have been dropped from the compilations herein. The regional boundaries were set for administrative convenience and are not related to topographical or meteorological similarities. State boundaries also are frequently unrelated to the parameters that influence air pollution, but the contrasts within a state are usually less marked.

TABLE 3-1. SUSPENDED PARTICULATES, URBAN

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev	
			Min	Frequency Distribution—Percent									Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90				
ALABAMA																
BIRMINGHAM	63	26	49	64	72	99	112	127	151	163	180	241	505	149	129	1.71
HUNTSVILLE	63	25	31	38	45	54	64	73	80	90	114	151	166	80	72	1.61
MONTGOMERY	63	26	29	38	45	54	70	85	97	104	117	127	163	84	76	1.63
ALASKA																
ANCHORAGE	63	26	5	18	35	41	44	51	61	76	107	151	234	71	52	2.40
ARIZONA																
PHOENIX	63	25	93	50	61	76	95	111	134	136	149	200	377	201	186	1.51
TUCSON	63	25	49	54	61	83	96	127	134	144	151	227	219	118	106	1.61
CALIFORNIA																
BERKELEY	63	23	22	23	40	45	54	72	81	90	112	127	194	75	64	1.78
GLENDALE	63	26	38	45	64	83	96	110	118	124	151	214	284	116	101	1.72
LONG BEACH	63	25	37	59	70	90	94	101	105	151	180	214	557	133	111	1.78
LOS ANGELES	63	26	40	59	76	92	97	105	135	151	173	214	251	127	114	1.63
OAKLAND	63	25	32	45	51	61	68	83	99	114	120	166	197	88	79	1.62
SAN BERNARDINO	63	23	52	59	81	90	117	180	230	246	264	292	316	173	146	1.85
SAN DIEGO	63	25	35	45	51	58	62	69	74	90	117	151	282	87	76	1.65
SAN FRANCISCO	63	26	29	35	38	45	56	62	72	83	99	107	158	72	64	1.61
SAN JOSE	63	26	32	45	54	64	72	92	100	105	120	180	287	101	87	1.73
SANTA BARBARA	63	25	23	35	40	64	72	80	84	90	101	120	162	75	67	1.63
STOCKTON	63	26	27	35	40	48	54	68	83	93	104	117	172	76	68	1.65
COLORADO																
DENVER	63	26	86	101	114	133	145	159	172	180	227	254	573	191	169	1.59
PUEBLO	63	25	67	76	83	96	107	116	121	135	151	197	222	121	114	1.40
CONNECTICUT																
HARTFORD	63	25	45	59	79	87	93	101	107	117	124	151	185	103	98	1.40
NEW HAVEN	63	25	38	50	57	68	76	81	84	88	99	143	167	85	80	1.45
NORWICH	63	26	31	38	42	54	51	67	72	75	90	101	171	71	65	1.53
WATERBURY	63	25	26	32	47	54	64	71	76	83	88	107	165	71	65	1.56
DELAWARE																
WILMINGTON	63	25	68	96	107	117	124	151	161	175	197	254	621	168	149	1.57
DIST. OF COL																
WASHINGTON	63	25	63	70	78	85	90	107	115	127	151	214	231	116	108	1.45
FLORIDA																
MIAMI	63	25	24	34	38	42	45	50	54	68	76	139	154	62	55	1.61
ORLANDO	63	22	40	42	45	64	70	76	81	85	99	117	136	76	71	1.43
ST PETERSBURG	63	25	28	32	38	42	45	50	52	58	62	76	78	50	48	1.33
TAMPA	63	23	45	54	78	83	88	99	107	114	120	151	184	102	97	1.39
GEORGIA																
ATLANTA	63	26	33	54	64	90	97	107	119	127	139	147	186	104	96	1.56
AUGUSTA	63	25	45	49	52	58	62	70	76	94	103	120	144	77	73	1.39
SAVANNAH	63	26	16	38	50	59	64	76	90	97	107	127	145	80	72	1.64

TABLE 3-1. SUSPENDED PARTICULATES, URBAN (Continued)

Location: Region, State or Station	Years	Number of Years	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
HAWAII HONOLULU	63	26	24	28	29	31	33	37	43	47	52	57	88	42	39	1.39	
IDAHO BOISE	63	23	26	38	45	57	61	70	81	90	107	127	167	77	70	1.58	
ILLINOIS CHICAGO	63	24	67	83	107	117	131	139	147	166	180	214	257	144	137	1.39	
EAST ST LOUIS	63	23	69	90	120	139	157	174	191	214	302	393	550	210	184	1.69	
JOLIET	63	26	35	51	59	76	90	107	127	161	197	254	480	136	111	1.89	
NORTH CHICAGO	63	23	20	27	45	54	66	74	90	101	127	254	539	114	81	2.22	
INDIANA EAST CHICAGO	63	21	42	107	120	135	151	187	200	214	241	359	409	191	171	1.66	
HAMMOND	63	26	30	83	96	117	133	151	173	197	254	302	581	186	155	1.88	
INDIANAPOLIS	63	23	93	110	120	127	139	158	173	191	214	278	367	174	163	1.44	
MUNCIE	63	25	34	51	68	78	93	90	107	117	124	166	195	99	92	1.50	
SOUTH BEND	63	26	52	64	76	87	96	127	141	151	173	197	236	126	115	1.55	
TERRE HAUTE	63	23	41	45	99	117	132	146	156	166	175	214	219	137	126	1.57	
IOWA CEDAR RAPIDS	63	26	39	81	90	107	115	127	141	151	173	197	319	137	125	1.58	
DAVENPORT	63	25	47	64	68	74	83	107	120	139	151	180	270	114	102	1.59	
DES MOINES	63	25	40	64	76	87	94	107	117	161	180	214	351	127	110	1.71	
KANSAS TOPEKA	63	26	32	38	54	62	70	80	85	88	107	151	379	93	79	1.72	
WICHITA	63	26	35	50	59	72	80	90	103	111	123	139	400	102	89	1.64	
LOUISIANA NEW ORLEANS	63	26	49	54	59	76	83	93	104	112	127	139	187	96	91	1.44	
MAINE PORTLAND	63	25	34	38	45	54	57	62	76	84	90	107	118	69	65	1.44	
MARYLAND BALTIMORE	63	26	43	68	76	111	119	130	141	148	170	214	292	137	125	1.57	
CUMBERLAND	63	26	58	70	76	92	97	105	120	139	170	191	220	120	112	1.47	
FORT HOWARD	63	25	28	40	45	50	52	70	78	85	90	122	191	75	67	1.60	
HAGERSTOWN	63	24	51	59	72	90	96	101	105	114	120	135	135	97	93	1.32	
RIVIERA BEACH	63	24	35	54	60	64	73	80	87	101	114	139	179	89	83	1.46	
ROCKVILLE	63	25	32	45	48	51	54	60	64	71	76	84	89	61	59	1.31	
MASSACHUSETTS BOSTON	63	22	42	64	80	90	111	119	127	134	144	151	180	114	108	1.43	
LOWELL	63	26	30	38	45	52	57	66	74	83	99	107	213	75	68	1.59	
WORCESTER	63	26	32	40	45	54	61	68	74	83	101	114	161	74	68	1.51	

TABLE 3-1. SUSPENDED PARTICULATES, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
MICHIGAN DEARBORN	63	26	37	48	54	90	96	104	120	135	166	214	409	127	107	1.81	
DETROIT	63	26	52	70	80	90	97	107	117	124	180	227	404	131	116	1.61	
FLINT	63	23	26	27	59	66	71	81	90	107	139	180	504	105	82	1.97	
GRAND RAPIDS	63	24	44	64	90	114	133	145	161	191	214	359	588	177	149	1.80	
JACKSON	63	26	28	38	42	50	57	64	80	87	107	166	330	87	72	1.81	
MUSKEGON	63	26	23	38	51	72	80	90	100	107	143	197	287	103	87	1.84	
MINNESOTA DULUTH	63	25	16	22	27	32	54	64	76	87	94	107	128	64	53	1.90	
MINNEAPOLIS	63	26	24	35	45	61	70	80	86	90	100	107	166	77	70	1.61	
ST PAUL	63	26	32	42	54	85	99	117	135	51	166	175	277	117	103	1.76	
MISSISSIPPI JACKSON	63	23	29	40	50	64	76	93	99	104	112	127	148	85	79	1.35	
MISSOURI KANSAS CITY	63	24	64	76	107	127	141	151	157	167	174	254	465	160	145	1.55	
ST LOUIS	63	25	42	76	82	90	101	120	137	146	156	170	180	118	111	1.44	
MONTANA HELENA	63	26	15	24	26	32	38	45	49	51	59	76	98	47	43	1.59	
NEBRASKA OMAHA	63	25	26	45	76	92	97	105	111	123	135	166	326	109	96	1.74	
NEVADA LAS VEGAS	63	24	43	81	99	127	139	147	161	191	214	302	553	171	150	1.69	
RENO	63	24	33	48	57	64	90	97	104	127	166	203	224	107	94	1.69	
NEW JERSEY ATLANTIC CITY	63	25	31	48	54	67	71	76	83	93	100	127	142	79	75	1.43	
BAYONNE	63	24	45	45	69	74	80	83	87	107	135	147	163	94	88	1.45	
HAMILTON	63	23	52	59	72	78	82	88	94	103	117	151	171	95	90	1.39	
JERSEY CITY	63	25	60	76	90	103	112	127	135	147	157	174	189	124	118	1.37	
NEWARK	63	26	41	64	70	90	95	102	110	117	127	180	246	110	101	1.53	
PATERSON	63	26	43	51	57	64	76	83	90	99	127	151	200	91	85	1.48	
NEW MEXICO ALBUQUERQUE	63	25	39	80	87	99	107	127	139	191	214	359	421	160	137	1.74	

TABLE 3-1. SUSPENDED PARTICULATES, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
NEW YORK																		
ALBANY	63	26	20	54	50	64	70	78	85	90	107	127	216	86	70	1.52		
BINGHAMTON	63	23	42	45	57	64	78	84	88	99	127	214	290	103	88	1.71		
BUFFALO	63	26	37	54	61	70	76	103	127	139	166	197	254	115	101	1.69		
MASSENA	63	26	18	24	26	36	39	43	48	54	64	70	129	47	43	1.56		
MT VERNON	63	26	47	54	61	70	76	93	104	117	143	166	262	106	95	1.62		
NEW ROCHELLE	63	26	28	35	40	45	49	54	64	90	103	117	165	69	62	1.62		
NEW YORK	63	25	75	83	107	143	180	214	234	270	302	427	431	215	189	1.71		
NIAGARA FALLS	63	26	30	64	76	90	112	120	127	151	197	254	359	140	120	1.76		
ROCHESTER	63	25	47	57	64	71	76	84	90	107	120	166	219	94	87	1.47		
SCHENECTADY	63	26	37	54	58	64	76	84	99	117	139	151	275	99	89	1.60		
SYRACUSE	63	26	48	59	76	101	110	120	131	139	151	170	269	123	113	1.54		
TROY	63	21	16	38	45	54	66	74	81	90	101	117	129	74	67	1.62		
UTICA	63	26	43	57	64	83	92	97	102	105	120	139	228	101	94	1.47		
NORTH CAROLINA																		
CHARLOTTE	63	26	36	54	67	76	85	111	123	132	146	180	246	112	101	1.61		
DURHAM	63	26	31	64	69	76	83	107	131	139	151	163	172	106	98	1.54		
GASTONIA	63	26	20	35	40	45	50	55	59	62	91	90	113	58	53	1.53		
GREENSBORO	63	26	28	38	43	51	56	62	72	81	96	107	123	68	64	1.47		
RALEIGH	63	24	16	34	38	43	50	54	59	70	81	99	121	58	53	1.55		
WILMINGTON	63	26	28	34	38	45	48	52	59	64	81	90	109	58	55	1.45		
NORTH DAKOTA																		
BISMARCK	63	26	15	27	50	59	64	70	76	85	107	143	679	108	74	2.21		
OHIO																		
AKRON	63	25	37	54	64	85	99	127	139	180	203	241	288	132	113	1.81		
CANTON	63	26	59	72	83	114	127	141	166	191	234	266	289	155	140	1.60		
CINCINNATI	63	26	69	82	87	94	98	103	127	137	151	180	204	121	116	1.36		
CLEVELAND	63	24	72	83	101	111	123	139	158	180	214	254	344	156	144	1.51		
COLUMBUS	63	26	37	70	80	90	99	110	117	122	139	166	227	112	105	1.47		
DAYTON	63	26	40	61	67	76	85	107	133	145	166	180	198	114	105	1.53		
HAMILTON	63	26	35	56	60	68	76	87	114	127	161	180	222	106	95	1.65		
TOLEDO	63	26	45	51	64	76	83	93	104	117	151	191	412	114	99	1.68		
YOUNGSTOWN	63	26	82	101	112	127	137	151	162	169	180	241	397	161	150	1.44		
OKLAHOMA																		
TULSA	63	25	27	40	43	51	57	70	78	82	85	90	108	65	61	1.43		
OREGON																		
EUGENE	63	21	17	38	48	54	59	70	90	127	151	214	400	105	80	2.06		
MEDFORD	63	24	40	47	54	59	68	76	83	114	127	180	374	99	84	1.71		
PORTLAND	63	24	26	27	54	67	76	82	87	112	122	143	166	87	70	1.63		

TABLE 3-1. SUSPENDED PARTICULATES, URBAN (Continued)

Location Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
PENNSYLVANIA																	
ALLENTOWN	63	26	43	57	64	90	97	107	119	127	141	151	176	106	99	1.47	
ALTOONA	63	22	49	54	67	76	90	101	112	122	151	170	254	110	101	1.52	
BETHLEHEM	63	26	27	81	90	109	114	120	127	134	144	151	180	118	111	1.47	
ERIE	63	25	50	64	69	76	85	94	99	105	127	151	214	100	95	1.40	
JOHNSTOWN	63	23	59	90	115	123	139	161	170	180	214	254	405	171	155	1.56	
PHILADELPHIA	63	25	73	99	107	127	143	161	170	187	200	234	308	156	148	1.40	
PITTSBURGH	63	25	53	90	127	139	147	166	180	214	270	359	402	185	164	1.67	
SCRANTON	63	26	57	90	107	122	133	151	180	214	244	302	413	177	158	1.62	
YORK	63	26	40	80	87	107	117	135	157	168	214	241	274	143	130	1.61	
RHODE ISLAND																	
EAST PROVIDENCE	63	25	31	35	45	59	64	68	71	75	81	107	112	66	63	1.43	
PROVIDENCE	63	21	23	54	76	90	96	104	127	139	151	214	422	129	110	1.81	
SOUTH CAROLINA																	
CHARLESTON	63	25	22	25	42	54	59	68	76	87	96	117	131	69	61	1.69	
COLUMBIA	63	23	21	32	47	50	54	64	70	76	85	107	141	68	62	1.53	
SOUTH DAKOTA																	
SIOUX FALLS	63	23	17	23	43	47	50	59	66	70	74	90	387	71	57	1.79	
TENNESSEE																	
CHATTANOOGA	63	25	73	107	137	151	163	180	203	230	246	302	328	189	176	1.47	
KNOXVILLE	63	25	52	76	85	96	101	110	116	124	151	214	314	124	114	1.51	
MEMPHIS	63	23	59	83	110	115	120	127	137	146	157	174	229	133	128	1.33	
NASHVILLE	63	26	58	76	90	100	107	117	127	143	180	197	285	133	124	1.45	
TEXAS																	
ABILENE	63	25	42	54	64	71	76	90	101	117	127	180	231	102	92	1.57	
AMARILLO	63	25	16	23	30	38	42	54	59	76	90	151	710	86	56	2.23	
AUSTIN	63	26	39	64	72	90	101	117	133	145	170	197	227	122	117	1.56	
CORPUS CHRISTI	63	23	40	54	62	66	70	76	82	87	99	127	174	83	79	1.40	
DALLAS	63	23	30	38	54	59	64	71	76	83	90	151	324	88	76	1.68	
EL PASO	63	26	51	76	94	107	115	127	145	158	180	203	294	136	125	1.52	
FT WORTH	63	24	41	50	59	64	76	85	94	107	120	166	184	93	86	1.49	
GALVESTON	63	23	25	32	45	57	62	72	81	90	117	151	297	87	74	1.78	
HOUSTON	63	22	37	66	70	76	82	87	99	112	127	151	199	100	94	1.44	
LUBBOCK	63	26	47	70	93	101	107	117	127	143	180	241	270	134	121	1.57	
ODESSA	63	26	18	64	72	85	93	104	113	118	127	166	185	107	97	1.63	
SAN ANGELO	63	26	21	48	54	67	73	82	90	97	107	127	259	93	82	1.68	
SAN ANTONIO	63	24	41	48	55	58	63	67	73	85	99	127	144	77	72	1.40	
TYLER	63	26	32	38	43	49	52	61	67	69	73	76	128	61	58	1.37	
WACO	63	25	46	57	62	70	76	82	86	107	120	180	216	94	87	1.48	
WICHITA FALLS	63	25	50	76	85	95	100	107	127	166	197	286	342	140	124	1.63	

TABLE 3-1. SUSPENDED PARTICULATES, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter													Std Geo Dev	
			Min	Frequency Distribution—Percent										Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90					
UTAH SALT LAKE CITY	63	25	51	64	70	83	94	107	117	135	151	270	293	123	108	1.65	
VERMONT BURLINGTON	63	21	18	32	38	42	45	54	59	64	76	83	87	55	51	1.47	
VIRGINIA HAMPTON	63	26	22	27	36	45	50	56	62	68	81	90	110	59	54	1.56	
NORFOLK	63	25	47	64	72	85	94	107	127	151	163	180	301	119	108	1.55	
PORTSMOUTH	63	25	30	59	64	69	73	81	90	97	102	127	167	85	81	1.39	
RICHMOND	63	25	53	61	66	74	77	82	84	89	94	107	138	83	81	1.23	
ROANOKE	63	22	51	54	59	68	76	94	103	117	151	197	260	106	95	1.59	
WASHINGTON BELLINGHAM	63	25	21	30	38	51	59	81	90	100	107	135	151	77	68	1.74	
CLARKSTON	63	26	55	68	76	112	122	180	200	214	234	247	396	168	148	1.70	
EVERETT	63	26	33	45	57	64	70	79	87	96	117	166	256	90	80	1.61	
SEATTLE	63	26	29	32	41	45	54	59	64	72	93	100	129	63	58	1.51	
SPOKANE	63	24	34	36	54	61	83	93	99	107	127	180	191	93	82	1.65	
TACOMA	63	26	35	40	43	50	57	64	83	93	104	127	251	81	71	1.67	
VANCOUVER	63	26	27	38	50	57	60	64	73	83	127	151	587	102	77	1.94	
WEST VIRGINIA CHARLESTON	63	26	42	68	76	101	117	151	203	234	302	382	459	192	157	1.93	
WISCONSIN KENOSHA	63	25	27	48	54	66	70	76	90	117	127	214	420	107	88	1.82	
MADISON	63	26	20	42	47	52	57	64	90	101	127	151	230	85	73	1.74	
MILWAUKEE	63	26	41	57	64	71	76	90	151	170	203	227	297	129	111	1.78	

TABLE 3-2. SUSPENDED PARTICULATES, STATE AND NATIONAL

TABLE 3-2. SUSPENDED PARTICULATES, STATE AND NATIONAL																		
Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
NATIONAL	63	4187	5	44	57	68	79	91	105	123	147	190	710	108	92	1.80		
ALABAMA	63	77	20	42	51	65	76	90	105	120	146	170	505	105	89	1.75		
ALASKA	63	26	5	18	35	41	44	51	61	76	107	151	234	71	52	2.40		
ARIZONA	63	50	49	61	93	107	130	143	170	195	214	278	377	159	140	1.69		
CALIFORNIA	63	276	22	39	51	62	73	87	99	111	131	191	557	102	85	1.79		
COLORADO	63	51	67	82	96	109	119	134	151	167	189	234	673	157	139	1.56		
CONNECTICUT	63	101	26	40	52	62	70	78	84	91	104	132	185	83	76	1.54		
DELAWARE	63	25	68	96	107	117	124	151	161	175	197	254	621	160	149	1.57		
DIST. OF COL.	63	25	63	70	78	85	90	107	115	127	151	214	231	116	108	1.45		
FLORIDA	63	95	24	38	42	48	53	65	75	84	97	127	184	72	65	1.57		
GEORGIA	63	77	16	46	54	61	72	86	96	106	121	137	186	87	80	1.56		
HAWAII	63	26	24	28	29	31	33	37	43	47	52	57	88	42	39	1.39		
IDAHO	63	23	26	38	45	57	61	70	81	90	107	127	167	77	70	1.58		
ILLINOIS	63	96	20	52	71	90	107	125	149	170	203	283	550	151	122	1.93		
INDIANA	63	144	30	68	88	107	122	137	152	172	198	243	581	151	133	1.67		
IOWA	63	76	39	64	75	87	99	114	127	146	168	200	351	126	113	1.63		
KANSAS	63	52	32	45	56	66	77	83	89	101	120	151	400	98	84	1.67		
LOUISIANA	63	26	49	54	59	76	83	93	104	112	127	139	187	96	91	1.44		
MAINE	63	25	34	38	45	54	57	62	76	84	90	107	118	69	65	1.44		
MARYLAND	63	150	28	48	57	67	75	87	99	113	127	155	292	97	87	1.59		
MASSACHUSETTS	63	74	30	40	50	60	69	76	88	105	120	144	213	86	78	1.59		
MICHIGAN	63	151	23	43	59	73	85	97	111	133	167	222	588	121	99	1.88		
MINNESOTA	63	77	16	28	40	57	74	83	90	102	121	155	277	86	73	1.85		
MISSISSIPPI	63	23	29	40	50	64	76	93	99	104	112	127	148	85	70	1.55		
MISSOURI	63	49	42	76	86	103	123	137	146	157	166	176	465	139	127	1.54		
MONTANA	63	26	15	24	26	32	38	45	49	51	59	76	98	47	43	1.59		
NEBRASKA	63	25	26	45	76	92	97	105	111	123	135	166	326	109	96	1.74		
NEVADA	63	48	33	54	76	90	102	127	144	168	191	227	553	139	119	1.77		
NEW JERSEY	63	149	31	55	67	75	82	90	100	113	134	156	246	99	92	1.48		

TABLE 3-2. SUSPENDED PARTICULATES, STATE AND NATIONAL (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter													Std Geo Dev	
			Min	Frequency Distribution—Percent										Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90					
NEW MEXICO	63	25	39	80	87	99	107	127	139	191	214	359	421	160	137	1.74	
NEW YORK	63	328	16	44	56	65	75	88	101	119	141	195	431	106	89	1.78	
NORTH CAROLINA	63	154	16	36	44	51	58	66	77	89	111	138	246	77	68	1.65	
NORTH DAKOTA	63	26	15	27	50	59	64	70	76	85	107	143	679	108	74	2.21	
OHIO	63	231	35	63	78	89	102	118	134	152	177	217	412	130	117	1.60	
OKLAHOMA	63	25	27	40	43	51	57	70	78	82	85	90	108	65	61	1.43	
OREGON	63	69	17	45	52	60	68	77	86	112	131	166	400	97	81	1.78	
PENNSYLVANIA	63	224	27	67	88	102	115	127	142	160	179	234	485	141	126	1.59	
RHODE ISLAND	63	46	23	38	56	65	70	76	90	100	120	145	422	95	81	1.74	
SOUTH CAROLINA	63	48	21	27	45	50	57	64	73	82	90	107	141	68	62	1.61	
SOUTH DAKOTA	63	23	17	23	43	47	50	59	66	70	74	90	387	71	57	1.79	
TENNESSEE	63	99	52	80	95	106	117	127	142	162	188	231	328	145	134	1.49	
TEXAS	63	395	16	47	58	67	75	85	98	113	133	173	710	101	88	1.69	
UTAH	63	25	51	64	70	83	94	107	117	135	151	270	293	123	108	1.65	
VERMONT	63	21	18	32	38	42	45	54	59	64	76	83	87	55	51	1.47	
VIRGINIA	63	123	22	48	58	65	72	80	89	98	110	151	301	90	81	1.57	
WASHINGTON	63	179	21	39	49	58	65	77	91	104	127	194	587	96	80	1.80	
WEST VIRGINIA	63	26	42	68	76	101	117	151	203	234	302	382	459	192	157	1.93	
WISCONSIN	63	77	20	46	53	62	70	78	99	127	166	208	420	107	89	1.81	

TABLE 3-3. SUSPENDED PARTICULATES, NONURBAN

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Gap Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
ALASKA PT WORONZOF	63	22	3	6	7	11	12	14	16	23	30	64	95	23	16	2.32	
ARIZONA GRAND CANYON PK	63	25	5	6	10	14	15	21	22	27	32	43	67	23	18	1.99	
MARICOPA COUNTY	63	26	16	36	39	44	47	52	67	73	85	94	105	60	56	1.54	
ARKANSAS MONTGOMERY CO	63	22	16	19	22	26	29	32	34	37	34	76	119	40	35	1.65	
CALIFORNIA HUMBOLDT COUNTY	63	20	10	19	23	27	29	31	34	38	45	54	76	34	31	1.56	
COLORADO MONTEZUMA COUNTY	63	23	1	4	6	11	13	15	21	32	47	54	70	25	16	2.85	
DELAWARE KENT COUNTY	63	21	23	32	40	43	48	56	60	64	72	83	105	56	53	1.43	
FLORIDA FLORIDA KEYS	63	25	13	19	22	26	28	30	31	33	36	45	59	30	29	1.39	
HAWAII KAHALUU	63	25	18	23	24	26	27	28	30	32	38	45	58	31	30	1.31	
IDAHO BUTTE COUNTY	63	25	4	5	7	9	16	20	22	27	29	31	46	19	16	2.03	
INDIANA PARKE COUNTY	63	24	16	19	32	35	45	49	52	68	76	99	172	57	49	1.75	
IOWA DELAWARE COUNTY	63	25	11	16	19	22	27	32	38	48	54	83	108	39	33	1.81	
MAINE ACADIA NAT PARK	63	21	6	8	10	11	13	16	25	30	45	51	56	24	19	1.97	
MARYLAND CALVERT COUNTY	63	26	15	25	30	34	36	39	43	45	57	62	78	42	39	1.47	
MISSOURI SHANNON COUNTY	63	21	11	15	21	24	27	32	34	37	54	64	74	35	31	1.65	
MONTANA GLACIER NAT PARK	63	21	3	4	5	6	7	13	19	21	23	27	47	16	12	2.23	
NEBRASKA THOMAS COUNTY	63	25	7	10	11	15	16	18	19	32	36	57	61	25	20	1.84	
NEVADA WHITE PINE CO	63	25	3	4	5	6	7	10	13	16	21	35	59	15	11	2.16	
NEW HAMPSHIRE COOS COUNTY	63	20	7	7	11	15	17	18	24	26	29	32	49	21	19	1.67	
NEW YORK CAPE VINCENT	63	25	12	16	18	22	24	27	30	35	40	45	62	30	27	1.53	
NORTH CAROLINA CAPE HATTERAS	63	23	15	19	26	30	33	37	42	47	50	59	84	39	36	1.49	
NORTH DAKOTA WARD COUNTY	63	24	12	14	20	23	30	34	38	45	59	90	843	73	38	2.42	
OKLAHOMA CHEROKEE COUNTY	63	24	18	25	30	34	38	50	57	64	76	107	128	55	41	1.67	
PENNSYLVANIA CLARION COUNTY	63	21	15	16	18	20	23	27	30	40	43	54	68	31	28	1.58	

TABLE 3-3. SUSPENDED PARTICULATES, NONURBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
RHODE ISLAND WASHINGTON CO	63	26	8	16	19	25	27	30	32	38	50	76	129	39	32	1.89		
SOUTH CAROLINA RICHLAND COUNTY	63	23	20	22	25	27	33	37	40	43	47	54	70	38	36	1.40		
SOUTH DAKOTA BLACK HILLS	63	26	4	6	7	11	13	17	32	38	45	54	83	27	19	2.41		
TEXAS ARANSAS COUNTY "	63	24	0	23	25	26	30	34	38	48	54	64	72	39	36	1.47		
VERMONT ORANGE COUNTY	63	25	8	16	23	25	27	35	39	43	45	54	59	34	31	1.63		
VIRGINIA SHENANDOAH PARK	63	26	12	19	21	24	25	30	36	39	43	45	66	33	31	1.48		
WISCONSIN DOOR COUNTY	63	24	4	5	11	12	13	27	34	42	47	54	70	29	22	2.26		
WYOMING YELLOWSTONE PARK	63	22	2	2	3	5	6	8	9	14	16	21	24	10	8	2.28		
* NOT STRICTLY A NONURBAN STATION ACCORDING TO RECENTLY RECEIVED INFORMATION																		

TABLE 3-4. SUSPENDED PARTICULATES, NONURBAN, STATE AND NATIONAL

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
NATIONAL	63	755	1	9	15	20	24	29	33	40	48	62	843	34	27	2.13		
ALASKA	63	22	3	6	7	11	12	14	16	23	30	44	95	23	16	2.32		
ARIZONA	63	51	5	10	15	21	30	39	43	50	69	85	105	42	32	2.22		
ARKANSAS	63	22	16	19	22	26	29	32	34	37	54	76	119	40	35	1.65		
CALIFORNIA	63	20	10	19	23	27	29	31	34	38	45	54	76	34	31	1.56		
COLORADO	63	23	1	4	6	11	13	15	21	32	47	54	70	25	16	2.85		
DELAWARE	63	21	23	32	40	43	48	56	60	64	72	83	105	56	53	1.43		
FLORIDA	63	25	13	19	22	26	28	30	31	33	36	45	59	30	29	1.39		
HAWAII	63	25	18	23	24	26	27	28	30	32	38	45	58	31	30	1.31		
IDAHO	63	25	4	5	7	9	16	20	22	27	29	31	46	19	16	2.03		
INDIANA	63	24	16	19	32	35	45	49	52	68	76	99	172	57	49	1.75		
IOWA	63	25	11	16	19	22	27	32	38	48	54	83	108	39	33	1.81		
MAINE	63	21	6	8	10	11	13	16	25	30	45	51	56	24	19	1.97		
MARYLAND	63	26	15	25	30	34	36	39	43	45	57	62	78	42	39	1.47		
MISSOURI	63	21	11	15	21	24	27	32	34	37	54	64	74	35	31	1.65		
MONTANA	63	21	3	4	5	6	7	13	19	21	23	27	47	16	12	2.23		
NEBRASKA	63	25	7	10	11	15	16	18	19	32	36	57	61	25	20	1.84		
NEVADA	63	25	3	4	5	6	7	10	13	16	21	35	59	15	11	2.16		
NEW HAMPSHIRE	63	20	7	7	11	15	17	18	24	26	29	32	49	21	19	1.67		
NEW YORK	63	25	12	16	18	22	24	27	30	35	40	45	62	30	27	1.53		
NORTH CAROLINA	63	23	15	19	26	30	33	37	42	47	50	59	84	39	36	1.49		
NORTH DAKOTA	63	24	12	14	20	23	30	34	38	45	59	90	843	73	38	2.42		
OKLAHOMA	63	24	18	25	30	34	38	50	57	64	76	107	128	55	49	1.67		
PENNSYLVANIA	63	21	15	16	18	20	23	27	30	40	43	54	68	31	28	1.58		
RHODE ISLAND	63	26	8	16	19	25	27	30	32	38	50	76	129	39	32	1.89		
SOUTH CAROLINA	63	23	20	22	25	27	33	37	40	43	47	54	70	38	36	1.40		
SOUTH DAKOTA	63	26	4	6	7	11	13	17	32	38	45	54	83	27	19	2.41		
TEXAS	63	24	20	23	25	26	30	34	38	48	54	64	72	39	36	1.47		
VERMONT	63	25	8	16	23	25	27	35	39	43	45	54	59	34	31	1.63		
VIRGINIA	63	26	12	19	21	24	25	30	36	39	43	45	66	33	31	1.48		
WISCONSIN	63	24	4	5	11	12	13	27	34	42	47	54	70	29	22	2.26		
WYOMING	63	22	2	2	3	5	6	8	9	14	16	21	24	10	8	2.28		

TABLE 3-5. SUSPENDED PARTICULATES,
NONQUALIFYING STATIONS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
ARKANSAS LITTLE ROCK	63	19	20	125	68
CALIFORNIA MONTEREY	63	20	21	92	48
CONNECTICUT NEW BRITAIN	63	22	39	150	84
ILLINOIS ROCKFORD	63	23	43	223	95
KENTUCKY LEXINGTON	63	24	38	127	77
LOUISVILLE	63	20	74	304	156
LOUISIANA SHREVEPORT	63	22	21	299	125
MARYLAND ANNAPOLIS	63	16	22	104	74
WESTMINSTER	63	22	20	140	64
MASSACHUSETTS SPRINGFIELD	63	18	27	165	83
MISSISSIPPI JACKSON COUNTY	63	20	7	64	31
NEW MEXICO COLFAX COUNTY	63	18	8	71	27
NEW YORK ELMIRA	63	13	30	290	93
NORTH CAROLINA GREENVILLE	63	19	27	112	66
SPARTA	63	21	9	73	31
SPRUCE PINE	63	12	32	378	127
HIGH POINT	63	19	62	180	117

TABLE 3-5. SUSPENDED PARTICULATES,
NONQUALIFYING STATIONS (Continued)

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
OKLAHOMA OKLAHOMA CITY	63	19	45	173	86
OREGON CURRY COUNTY	63	21	4	106	57
PUERTO RICO SAN JUAN	63	10	53	121	89
TEXAS BEAUMONT	63	16	32	378	99
HARLINGEN	63	20	31	207	80
TEXAS CITY	63	22	8	241	62
VIRGINIA LYNCHBURG	63	22	54	161	106
WASHINGTON CLALLAM COUNTY	63	19	3	41	15
HOQUIAM	63	13	23	146	55
WEST VIRGINIA WHEELING	63	20	57	273	155
WYOMING CHEYENNE	63	25	13	73	43

TABLE 3-6 BENZENE SOLUBLE ORGANICS, URBAN

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
ALABAMA																	
BIRMINGHAM	63	26	4.2	4.7	5.1	7.9	8.8	9.6	10.3	12.2	14.4	17.0	77.6	12.9	10.1	1.87	
HUNTSVILLE	63	25	.7	3.8	4.0	4.4	4.9	5.8	6.3	8.8	11.3	17.0	30.6	8.0	6.3	2.11	
MONTGOMERY	63	26	2.7	3.0	3.8	4.9	6.3	8.1	9.8	11.3	14.4	16.1	32.5	10.0	7.9	2.01	
ALASKA																	
ANCHORAGE	63	26	.3	1.3	1.4	2.0	2.7	3.6	4.3	4.9	5.7	6.1	8.7	3.7	2.9	2.19	
ARIZONA																	
PHOENIX	63	25	3.4	4.3	4.8	6.3	8.1	10.3	12.2	13.9	23.6	30.4	35.2	12.9	10.1	2.03	
TUCSON	63	25	2.3	3.0	3.4	4.5	5.3	5.9	6.3	8.3	9.3	11.3	17.8	6.5	5.7	1.68	
CALIFORNIA																	
BERKELEY	63	23	2.1	2.3	3.2	4.0	4.5	5.1	6.3	7.0	10.3	23.6	33.4	8.6	6.2	2.18	
GLENDALE	63	26	3.3	4.2	6.3	8.8	9.8	11.6	13.1	14.0	16.1	20.0	41.0	13.1	10.8	1.88	
LONG BEACH	63	25	2.4	3.0	3.8	4.2	4.5	5.3	6.3	14.4	17.0	35.9	40.7	11.5	7.6	2.43	
LOS ANGELES	63	26	4.5	5.8	6.9	9.3	10.3	11.7	13.7	17.0	23.6	27.9	44.5	15.1	12.7	1.82	
OAKLAND	63	25	2.2	3.2	3.8	4.9	5.8	7.9	8.8	11.6	13.3	23.6	30.8	9.9	7.7	2.04	
SAN BERNARDINO	63	23	3.5	3.6	6.3	9.3	10.3	14.4	15.7	17.0	21.2	35.9	40.7	15.2	12.1	2.07	
SAN DIEGO	63	25	2.9	3.4	3.8	4.8	5.3	7.4	10.3	12.9	14.4	20.0	38.5	10.2	7.9	2.03	
SAN FRANCISCO	63	26	.8	3.4	3.8	5.7	6.1	7.4	8.5	9.6	12.9	14.4	23.3	8.5	7.0	2.01	
SAN JOSE	63	26	1.8	3.2	4.0	4.8	5.3	6.9	8.3	12.2	17.0	23.6	62.3	12.5	8.0	2.42	
SANTA BARBARA	63	25	1.0	2.6	3.2	3.8	4.1	4.5	5.8	6.9	7.4	17.0	18.6	6.5	5.2	1.96	
STOCKTON	63	26	2.4	2.7	3.0	3.3	3.6	4.5	5.7	6.1	10.3	17.0	23.7	7.0	5.4	1.99	
COLORADO																	
DENVER	63	26	5.6	7.4	10.3	11.7	12.6	14.0	15.4	16.5	19.0	23.6	67.9	16.9	14.3	1.72	
PUEBLO	63	25	2.6	2.9	3.2	3.7	4.2	5.0	5.8	7.9	8.8	12.2	13.6	6.2	5.4	1.70	
CONNECTICUT																	
HARTFORD	63	25	3.6	5.3	5.8	6.5	7.0	7.8	8.5	9.8	10.8	12.2	12.7	8.0	7.5	1.42	
NEW HAVEN	63	25	3.0	3.6	4.7	5.3	5.6	6.1	6.6	7.4	8.3	12.2	12.9	6.8	6.3	1.46	
NORWICH	63	26	2.8	3.2	3.5	4.5	4.9	5.8	6.7	7.2	8.1	8.8	12.1	6.0	5.5	1.51	
WATERBURY	63	25	2.3	2.7	3.6	4.3	4.7	5.3	6.5	6.9	7.2	10.3	16.1	6.0	5.4	1.61	
DELAWARE																	
WILMINGTON	63	25	4.1	6.3	7.4	8.8	9.2	9.9	10.3	11.4	12.2	14.4	35.2	10.8	9.8	1.52	
DIST. OF COL.																	
WASHINGTON	63	25	3.2	4.8	5.3	6.9	7.7	8.5	9.6	12.2	14.4	23.6	37.1	10.8	9.0	1.80	
FLORIDA																	
MIAMI	63	25	2.3	2.7	3.0	3.4	3.7	4.1	4.4	5.6	6.3	8.8	10.4	4.8	4.4	1.53	
ORLANDO	63	22	1.7	2.7	3.0	3.8	4.3	4.6	4.9	5.2	6.0	7.4	15.2	5.0	4.5	1.57	
ST PETERSBURG	63	25	.8	1.6	1.8	2.3	2.5	2.7	3.4	3.8	4.2	4.9	5.5	3.0	2.7	1.59	
TAMPA	63	23	2.4	3.5	4.2	4.5	5.3	6.3	7.0	7.8	8.5	12.2	16.0	6.7	6.1	1.59	
GEORGIA																	
ATLANTA	63	26	1.4	3.2	4.2	5.3	5.8	6.9	8.1	8.8	10.8	11.7	14.3	7.4	6.5	1.73	
AUGUSTA	63	25	2.9	3.5	3.8	4.5	4.8	5.3	6.3	9.3	10.3	12.2	23.2	7.4	6.3	1.72	
SAVANNAH	63	26	1.1	1.7	3.3	3.7	4.2	4.8	5.2	5.6	6.9	8.8	12.2	5.2	4.5	1.78	

TABLE 3-6. BENZENE SOLUBLE ORGANICS, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
HAWAII HONOLULU	63	26	1.6	2.2	2.4	2.6	3.2	3.9	4.4	4.9	6.7	7.4	8.8	4.3	3.8	1.66	
IDAHO BOISE	63	23	1.3	2.5	4.0	4.5	5.0	6.0	6.7	7.4	10.3	14.4	24.0	7.5	6.1	1.92	
ILLINOIS CHICAGO	63	24	4.0	4.5	6.3	8.8	9.4	9.9	10.3	11.4	12.2	14.4	17.9	10.0	9.4	1.46	
EAST ST LOUIS	63	23	5.3	6.3	8.1	8.8	9.8	12.2	14.4	18.0	20.0	25.8	43.2	14.5	12.6	1.71	
JOLIET	63	26	2.3	3.2	4.3	4.9	5.3	6.3	8.5	9.6	11.6	14.4	21.2	8.0	6.9	1.77	
NORTH CHICAGO	63	23	2.0	2.2	2.9	3.2	5.0	6.0	6.9	8.8	15.7	19.0	21.3	8.3	6.2	2.18	
INDIANA EAST CHICAGO	63	20	1.8	2.3	5.6	6.1	6.5	7.0	7.4	8.8	11.3	12.9	13.8	7.9	7.1	1.70	
HAMMOND	63	26	2.5	5.0	5.6	7.4	8.3	9.3	10.0	10.8	12.2	14.4	27.7	10.1	8.9	1.67	
INDIANAPOLIS	63	23	6.5	8.1	10.7	11.4	12.2	13.3	14.0	15.3	17.0	27.9	40.6	15.2	13.9	1.53	
MUNCIE	63	25	2.7	3.2	4.1	4.5	5.6	6.5	6.9	7.4	8.8	12.2	17.2	7.0	6.3	1.60	
SOUTH BEND	63	26	4.4	4.8	5.3	6.1	6.7	7.6	8.2	8.6	9.8	12.2	20.3	8.2	7.7	1.45	
TERRE HAUTE	63	23	3.0	3.8	5.8	6.6	7.1	8.1	8.8	12.2	17.0	23.6	25.1	10.6	8.9	1.82	
IOWA CEDAR RAPIDS	63	26	2.7	3.2	4.3	4.9	5.3	5.8	6.3	6.7	7.4	9.6	21.2	6.8	6.0	1.60	
DAVENPORT	63	25	2.1	3.2	4.2	5.8	6.6	7.4	8.8	10.3	14.4	23.6	44.1	10.4	7.9	2.07	
DES MOINES	63	25	2.5	3.2	3.8	4.5	5.3	6.3	6.7	7.4	8.3	14.4	27.2	7.4	6.2	1.76	
KANSAS TOPEKA	63	26	1.2	2.0	2.4	2.7	3.2	3.8	5.3	6.3	8.8	12.2	29.8	6.1	4.5	2.07	
WICHITA	63	26	.6	2.1	2.3	3.9	4.2	4.8	5.5	5.9	7.4	8.0	8.5	5.0	4.3	1.84	
LOUISIANA NEW ORLEANS	63	26	2.0	5.0	5.6	6.3	7.4	9.7	10.9	12.2	13.5	14.4	23.2	10.0	8.8	1.71	
MAINE PORTLAND	63	25	1.8	2.9	3.1	4.2	4.5	5.3	5.6	5.9	6.2	8.8	9.4	5.2	4.8	1.49	
MARYLAND BALTIMORE	63	26	3.5	4.5	6.3	8.0	8.5	10.3	11.3	11.9	14.4	16.1	24.8	10.6	9.6	1.59	
CUMBERLAND	63	26	3.7	5.3	6.9	7.8	8.5	9.6	12.2	15.3	18.5	21.8	35.2	12.6	10.8	1.77	
MASSACHUSETTS BOSTON	63	22	4.0	4.5	5.8	8.1	8.8	10.3	11.3	12.2	13.5	14.4	20.7	10.1	9.3	1.54	
LOWELL	63	26	2.6	3.0	4.0	4.8	5.3	5.9	6.9	8.1	9.8	12.2	17.5	6.9	6.1	1.65	
WORCESTER	63	26	1.6	3.2	3.4	3.7	4.7	5.7	6.3	6.9	7.8	8.5	9.9	5.7	5.2	1.57	
MICHIGAN DEARBORN	63	26	3.0	4.2	4.8	5.6	6.3	8.1	9.4	10.0	11.6	14.4	20.4	8.7	7.7	1.66	
DETROIT	63	26	2.9	4.2	4.7	5.3	6.3	7.4	9.4	10.0	11.6	14.4	19.4	8.6	7.6	1.66	
FLINT	63	23	2.1	2.3	3.5	4.0	4.3	5.5	5.9	6.3	9.2	10.3	15.2	6.3	5.4	1.72	
GRAND RAPIDS	63	24	3.4	4.0	5.6	6.3	7.6	8.1	8.6	9.6	10.3	17.0	19.0	8.7	7.9	1.58	
JACKSON	63	26	.7	2.2	2.7	3.2	3.8	4.3	5.3	6.0	8.1	8.8	14.0	5.2	4.3	1.92	
MUSKEGON	63	26	1.6	3.8	4.8	5.3	5.6	6.1	7.4	8.3	9.8	14.4	18.2	7.6	6.6	1.72	

TABLE 3-6. BENZENE SOLUBLE ORGANICS, URBAN (CONTINUED)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
MINNESOTA DULUTH	63	25	1.1	1.7	2.0	3.0	3.4	4.0	4.5	5.3	6.9	8.8	11.1	4.6	3.8	1.84	
MINNEAPOLIS	63	26	1.9	2.2	2.4	2.8	3.1	4.0	4.5	5.8	7.0	8.8	20.7	5.4	4.3	1.87	
ST PAUL	63	26	1.8	3.2	4.5	6.3	6.6	7.1	7.9	8.8	10.3	14.4	33.0	8.8	7.3	1.86	
MISSISSIPPI JACKSON	63	23	2.0	2.3	3.5	4.0	4.3	5.6	6.3	7.9	8.8	11.6	25.5	6.8	5.6	1.84	
MISSOURI KANSAS CITY	63	24	3.9	4.5	5.6	6.0	7.4	8.8	9.8	12.2	13.3	15.7	28.8	9.7	8.6	1.62	
ST LOUIS	63	25	3.5	4.9	5.6	6.5	7.0	7.7	8.2	10.3	11.3	14.4	15.7	8.4	7.8	1.49	
MONTANA HELENA	63	26	.6	.9	1.0	1.3	1.5	2.0	2.5	2.7	3.8	7.4	13.2	3.2	2.2	2.26	
NEBRASKA OMAHA	63	25	2.3	3.2	4.5	5.1	5.8	8.0	8.5	9.6	10.3	14.4	42.6	8.7	7.0	1.85	
NEVADA LAS VEGAS	63	23	4.0	4.9	6.7	7.4	8.1	9.3	10.3	11.6	14.4	17.0	35.4	10.7	9.4	1.65	
RENO	63	23	3.3	3.8	4.9	5.3	6.3	8.1	10.3	13.7	17.0	27.9	33.9	11.5	9.0	2.02	
NEW JERSEY ATLANTIC CITY	63	25	.8	1.9	2.1	2.4	2.5	2.8	3.0	3.5	4.0	4.9	7.8	3.1	2.8	1.55	
BAYONNE	63	24	2.1	3.2	3.6	3.8	5.3	6.3	7.0	10.8	11.7	13.7	14.9	7.4	6.3	1.80	
HAMILTON	63	23	1.6	3.0	4.0	4.2	4.3	4.8	5.3	7.4	8.0	8.8	11.3	5.8	5.3	1.56	
JERSEY CITY	63	25	3.2	4.7	5.1	6.3	6.7	7.4	9.3	11.3	12.9	15.7	21.9	9.0	8.0	1.62	
NEWARK	63	26	4.1	5.0	7.4	7.9	8.2	8.6	10.3	12.2	15.3	17.0	23.3	10.6	9.6	1.56	
PATERSON	63	26	3.4	4.5	4.8	5.3	6.3	7.4	8.2	8.8	10.9	12.2	21.0	8.0	7.3	1.55	
NEW MEXICO ALBUQUERQUE	63	25	3.5	4.9	5.6	6.7	7.4	8.0	8.4	9.6	11.3	23.6	43.3	10.7	8.8	1.80	
NEW YORK ALBANY	63	26	1.0	2.7	3.4	3.8	4.0	4.3	4.8	5.3	6.1	6.9	11.9	4.8	4.3	1.62	
BINGHAMTON	63	23	2.6	3.8	4.5	4.9	5.3	6.1	6.7	7.4	10.3	20.0	35.7	9.0	7.1	1.89	
BUFFALO	63	13	1.0	1.0	3.0	3.2	3.5	6.3	6.9	7.4	9.6	12.2	17.2	6.4	5.0	2.16	
MASSENA	63	26	.7	1.0	1.2	1.6	1.7	2.0	2.8	3.0	3.3	3.6	5.6	2.4	2.1	1.69	
MT VERNON	63	26	1.8	3.9	4.2	5.3	6.0	7.9	9.2	9.9	11.6	13.3	21.9	8.3	7.2	1.75	
NEW YORK	63	25	5.4	6.9	7.9	10.3	11.6	17.6	18.8	21.8	27.9	31.7	40.1	17.1	14.6	1.80	
NIAGARA FALLS	63	26	1.3	1.9	2.2	3.2	3.5	4.2	5.3	6.3	7.9	8.8	11.2	5.2	4.4	1.88	
ROCHESTER	63	25	2.2	3.5	3.9	4.4	4.8	5.6	6.3	7.0	7.4	8.8	10.9	5.8	5.4	1.46	
SCHENECTADY	63	26	2.7	4.2	4.6	5.0	5.3	7.0	9.2	9.9	11.6	15.7	26.4	8.7	7.4	1.77	
SYRACUSE	63	26	3.8	5.0	6.3	7.1	7.6	8.1	8.6	9.2	10.3	12.2	21.5	9.0	8.3	1.49	
TROY	63	21	1.5	2.3	2.7	2.9	3.1	3.8	4.5	5.6	6.3	8.1	17.5	4.9	4.2	1.75	
UTICA	63	26	3.2	3.5	3.8	4.5	4.8	5.3	6.3	8.3	11.3	15.3	19.4	7.5	6.4	1.72	

TABLE 3-6. BENZENE SOLUBLE ORGANICS, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter													Std Geo Dev	
			Min	Frequency Distribution—Percent										Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90					
NORTH CAROLINA CHARLOTTE	63	26	1.0	4.2	4.9	6.0	6.7	7.7	8.5	9.6	15.7	20.0	50.0	11.3	8.1	2.30	
DURHAM	63	26	3.8	5.6	6.3	7.4	7.9	8.6	9.4	10.0	14.4	17.0	22.9	9.9	9.0	1.56	
GREENSBORO	63	26	1.4	2.3	2.6	3.8	4.3	5.3	6.1	6.7	8.1	10.3	16.2	5.9	5.0	1.84	
RALEIGH	63	24	1.3	1.7	2.4	2.6	2.9	3.1	3.8	4.9	5.8	7.4	13.3	4.2	3.6	1.72	
NORTH DAKOTA BISMARCK	63	26	.9	1.9	2.8	3.1	3.3	3.5	3.8	4.1	4.5	6.9	9.3	4.0	3.5	1.68	
OHIO AKRON	63	25	1.2	2.4	2.7	5.3	5.7	6.3	8.1	9.6	10.3	17.0	33.0	8.5	6.4	2.17	
CANTON	63	26	2.1	4.8	5.3	7.0	8.1	10.8	12.2	13.7	20.0	23.6	42.1	12.6	10.3	1.95	
CINCINNATI	63	26	3.0	5.8	6.5	7.2	7.8	8.8	10.3	11.1	12.2	14.4	17.7	9.5	8.8	1.51	
CLEVELAND	63	24	4.1	4.5	6.0	6.6	7.4	8.3	10.9	12.9	14.4	17.0	20.7	10.1	9.1	1.61	
COLUMBUS	63	26	4.3	4.6	4.8	5.0	5.2	6.7	7.7	8.2	9.3	10.3	28.3	7.9	7.1	1.54	
DAYTON	63	26	2.2	3.2	4.2	5.3	6.0	6.6	7.0	7.3	8.1	8.8	13.8	6.5	6.0	1.51	
HAMILTON	63	26	2.6	3.0	3.5	4.7	5.0	5.8	7.8	8.5	10.3	12.2	17.1	7.1	6.2	1.70	
TOLEDO	63	26	2.2	3.4	3.7	4.6	4.9	5.3	5.9	6.3	9.3	10.3	14.8	6.4	5.7	1.62	
YOUNGSTOWN	63	26	3.9	4.5	5.3	5.8	6.1	8.8	9.9	10.9	17.0	19.0	44.5	11.2	9.0	1.88	
OKLAHOMA TULSA	63	25	1.9	2.2	2.5	3.0	3.2	3.7	3.9	4.4	4.9	6.3	7.9	3.9	3.6	1.47	
OREGON EUGENE	63	21	3.9	4.5	6.3	7.0	7.9	10.3	13.7	18.5	25.0	27.9	109.3	19.6	12.5	2.38	
MEDFORD	63	24	4.0	4.5	7.4	8.8	10.3	13.3	14.4	21.8	27.9	42.4	128.3	20.4	14.0	2.25	
PORTLAND	63	24	.3	2.3	4.3	4.8	5.8	6.7	7.4	8.5	9.6	12.2	19.8	7.2	5.8	2.23	
PENNSYLVANIA ALLENTOWN	63	26	3.1	3.3	3.6	4.0	4.5	5.3	5.8	6.1	6.6	6.9	7.3	5.2	5.0	1.34	
ALTOONA	63	22	1.6	4.0	4.5	6.7	7.4	8.8	12.9	14.4	27.9	38.9	48.6	15.1	10.6	2.41	
BETHLEHEM	63	26	2.3	3.2	4.3	5.3	5.6	6.1	7.8	8.5	9.4	10.0	20.5	7.3	6.4	1.67	
ERIE	63	25	2.3	3.8	4.3	4.9	5.3	6.6	7.1	8.1	8.8	12.2	19.4	7.1	6.4	1.58	
JOHNSTOWN	63	23	3.0	3.8	6.9	7.8	8.5	10.8	11.7	13.3	17.0	23.6	34.1	12.3	10.3	1.84	
PHILADELPHIA	63	25	4.8	5.8	6.3	7.4	8.1	9.0	9.6	10.3	11.6	16.1	24.3	9.8	9.1	1.46	
PITTSBURGH	63	25	2.8	5.8	6.5	7.2	7.8	8.8	11.6	13.7	18.5	26.5	32.5	12.0	10.0	1.83	
SCRANTON	63	26	2.9	6.3	8.8	9.7	10.3	12.2	15.3	17.0	20.9	22.7	37.5	14.4	12.5	1.78	
YORK	63	26	3.5	4.5	5.3	6.3	7.0	7.8	8.3	8.6	10.3	14.4	17.1	8.4	7.8	1.50	
RHODE ISLAND EAST PROVIDENCE	63	25	3.3	3.9	4.2	4.8	5.3	5.8	6.1	6.7	7.2	8.1	8.6	5.8	5.6	1.31	
PROVIDENCE	63	21	3.2	3.8	4.5	5.6	6.3	7.4	8.1	8.8	9.8	12.2	41.8	10.0	7.7	1.91	
SOUTH CAROLINA CHARLESTON	63	25	.9	3.0	3.5	4.2	4.5	4.9	5.2	6.0	6.9	8.8	10.3	5.2	4.7	1.64	
COLUMBIA	63	23	2.1	3.0	3.5	3.8	4.3	5.0	5.6	6.1	6.3	14.4	30.7	6.8	5.4	1.85	
SOUTH DAKOTA SIOUX FALLS	63	23	.2	.9	1.7	1.9	2.1	2.7	3.2	3.8	4.3	6.9	7.6	3.2	2.5	2.21	

TABLE 3-6. BENZENE SOLUBLE ORGANICS, URBAN (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
TENNESSEE																	
CHATTANOOGA	63	25	3.9	5.3	7.8	8.8	9.6	12.2	17.0	18.8	20.0	27.9	40.9	14.6	12.3	1.84	
KNOXVILLE	63	25	1.7	5.3	6.3	7.4	7.8	8.4	8.8	10.3	12.9	21.8	31.8	10.2	8.7	1.78	
MEMPHIS	63	23	3.6	3.8	5.3	6.0	7.4	8.2	8.8	9.6	10.3	14.4	15.6	8.5	7.8	1.55	
NASHVILLE	63	26	2.9	4.2	5.3	6.7	7.4	10.3	12.9	14.4	16.0	17.0	27.6	11.3	9.5	1.85	
TEXAS																	
ABILENE	63	25	1.8	2.0	2.5	2.9	3.2	3.6	3.8	4.9	5.8	9.8	11.3	4.5	3.9	1.69	
AMARILLO	63	25	1.8	1.2	1.6	2.0	2.4	2.7	3.3	3.7	4.5	5.8	10.8	3.6	2.8	1.93	
AUSTIN	63	26	2.2	2.5	3.2	3.6	3.8	4.6	5.0	5.2	8.8	11.3	12.7	5.5	4.8	1.67	
CORPUS CHRISTI	63	23	2.1	3.4	4.0	4.5	4.8	5.3	5.6	6.0	6.3	10.3	15.6	5.8	5.4	1.50	
DALLAS	63	23	2.2	3.5	4.2	4.5	4.8	5.3	5.6	6.0	6.3	10.3	29.1	6.6	5.6	1.66	
EL PASO	63	26	1.7	2.2	2.9	3.5	4.2	4.9	6.3	7.4	8.8	13.7	26.8	7.0	5.4	2.04	
FT WORTH	63	24	2.7	3.0	4.5	5.3	5.8	6.1	6.7	8.1	9.6	14.4	25.4	7.7	6.6	1.70	
GALVESTON	63	23	1.3	1.4	2.0	2.2	2.5	3.0	3.5	4.5	4.9	6.3	9.3	3.6	3.2	1.69	
HOUSTON	63	22	2.4	2.9	3.2	4.9	5.6	6.3	7.9	8.8	9.9	12.2	25.2	7.8	6.5	1.80	
LUBBOCK	63	26	2.2	3.0	3.4	4.2	4.8	6.3	7.0	7.4	9.6	11.3	20.0	6.9	5.9	1.76	
ODESSA	63	26	2.4	2.9	3.2	4.0	4.5	5.1	6.0	6.6	7.4	8.8	14.0	5.8	5.2	1.58	
SAN ANGELO	63	26	1.6	2.7	3.0	3.5	3.8	4.2	5.3	5.7	6.3	8.1	9.0	4.8	4.4	1.55	
SAN ANTONIO	63	24	2.6	3.0	3.4	3.6	4.0	4.5	5.0	6.0	6.9	8.8	15.9	5.7	5.0	1.59	
TYLER	63	26	1.7	3.8	4.2	4.8	5.3	5.6	6.0	6.2	6.9	7.4	15.9	5.9	5.5	1.49	
WACO	63	25	2.3	2.6	2.8	3.2	3.8	4.2	4.5	5.1	6.3	10.3	16.7	5.1	4.5	1.63	
WICHITA FALLS	63	25	2.6	3.2	3.8	4.2	4.4	5.3	5.8	7.4	8.3	12.2	27.0	7.2	5.8	1.77	
UTAH																	
SALT LAKE CITY	63	25	1.8	2.5	3.5	4.3	4.7	5.1	5.8	8.3	10.9	20.0	26.3	7.5	5.8	2.01	
VERMONT																	
BURLINGTON	63	21	1.2	1.7	1.9	2.7	2.9	3.1	3.3	3.6	3.8	4.5	7.7	3.3	3.0	1.53	
VIRGINIA																	
HAMPTON	63	26	1.7	1.2	1.5	2.0	2.3	3.4	4.0	4.5	5.0	5.3	6.2	3.3	2.8	1.86	
NORFOLK	63	25	1.9	3.5	4.0	4.5	5.0	6.0	6.9	8.0	8.5	10.3	11.8	6.3	5.8	1.59	
PORTSMOUTH	63	25	1.7	3.2	3.6	4.3	4.9	6.3	7.4	9.8	10.8	12.2	20.9	7.2	6.1	1.83	
RICHMOND	63	25	3.0	3.8	4.2	4.8	5.3	6.6	7.1	9.2	9.9	12.2	24.0	7.6	6.6	1.68	
ROANOKE	63	22	2.9	3.5	4.0	4.9	5.5	5.9	6.3	7.4	12.2	23.6	25.8	8.8	7.1	1.86	
WASHINGTON																	
SEATTLE	63	26	2.8	3.1	3.8	4.9	5.6	6.3	7.1	8.1	9.8	12.2	24.6	7.5	6.4	1.73	
SPOKANE	63	24	1.8	2.3	3.8	4.5	5.8	6.7	7.4	9.2	9.9	14.4	19.9	7.5	6.3	1.86	
WEST VIRGINIA																	
CHARLESTON	63	26	2.6	4.6	4.8	5.2	5.6	6.6	7.4	9.3	10.9	12.2	18.8	7.8	7.0	1.60	
WISCONSIN																	
KENOSHA	63	25	3.1	3.8	4.8	5.3	5.7	6.3	7.4	9.8	10.8	12.2	14.3	7.4	6.7	1.55	
MADISON	63	26	2.2	2.7	3.5	4.0	4.3	4.8	5.6	6.3	8.8	11.3	14.2	6.0	5.3	1.87	
MILWAUKEE	63	26	3.6	4.2	5.3	6.3	6.7	7.2	8.8	9.8	11.3	12.2	29.6	9.0	7.8	1.66	

TABLE 3-7. BENZENE SOLUBLE ORGANICS, URBAN, STATE AND NATIONAL

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter													Std Geo Dev	
			Min	Frequency Distribution—Percent										Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90					
NATIONAL	63	3866	.2	2.8	3.7	4.5	5.3	6.2	7.4	8.8	11.0	15.1	128.3	8.1	6.5	1.99	
ALABAMA	63	77	.7	3.8	4.3	5.0	6.3	8.2	9.4	10.9	14.0	16.6	77.6	10.3	7.9	2.0	
ALASKA	63	26	.3	1.3	1.4	2.0	2.7	3.6	4.3	4.9	5.7	6.1	8.	3.7	2.9	2.19	
ARIZONA	63	50	2.3	3.4	4.2	5.0	5.8	7.4	8.8	10.3	12.8	23.6	35.2	9.7	7.6	1.97	
CALIFORNIA	63	276	.8	3.1	3.8	4.6	5.8	7.2	9.6	12.4	15.8	22.6	62.3	10.7	7.9	2.17	
COLORADO	63	51	2.6	3.2	4.2	5.6	7.4	10.3	11.9	13.5	15.4	19.0	67.9	11.7	8.9	2.06	
CONNECTICUT	63	101	2.3	3.4	4.1	4.9	5.6	6.4	6.9	7.5	8.7	10.8	16.1	6.7	6.1	1.33	
DELAWARE	63	25	4.1	6.3	7.4	8.8	9.2	9.9	10.3	11.4	12.2	14.4	35.2	10.8	9.8	1.32	
DIST. OF COL.	63	25	3.2	4.8	5.3	6.9	7.7	8.5	9.6	12.2	14.4	23.6	37.1	10.8	9.0	1.80	
FLORIDA	63	95	.8	2.3	2.7	3.3	3.7	4.2	4.6	5.4	6.3	8.4	16.0	4.8	4.2	1.70	
GEORGIA	63	77	1.1	3.2	3.7	4.3	4.8	5.4	6.2	7.9	9.8	11.4	23.2	6.7	5.7	1.78	
HAWAII	63	26	1.6	2.2	2.4	2.6	3.2	3.9	4.4	4.9	6.7	7.4	8.8	4.3	3.8	1.66	
IDAHO	63	23	1.3	2.5	4.0	4.5	5.0	6.0	6.7	7.4	10.3	14.4	24.0	7.5	6.1	1.92	
ILLINOIS	63	96	2.0	3.2	4.9	5.9	7.7	8.9	10.1	11.6	14.9	18.9	43.2	10.1	8.4	1.88	
INDIANA	63	143	1.8	4.4	5.6	6.4	7.2	8.2	9.4	11.1	12.9	17.0	40.6	9.8	8.5	1.72	
IOWA	63	76	2.1	3.1	4.1	4.8	5.6	6.3	6.9	7.6	9.7	15.7	44.1	8.2	6.6	1.82	
KANSAS	63	52	.6	2.0	2.4	3.2	3.9	4.6	5.3	6.0	7.6	8.8	29.8	5.5	4.4	1.95	
LOUISIANA	63	26	2.0	5.0	5.6	6.3	7.4	9.7	10.9	12.2	13.5	14.4	23.2	10.0	8.8	1.71	
MAINE	63	25	1.8	2.9	3.1	4.2	4.5	5.3	5.6	5.9	6.2	8.8	9.4	5.2	4.8	1.49	
MARYLAND	63	52	3.5	4.9	6.7	7.9	8.6	9.8	11.1	12.9	16.1	20.0	35.2	11.6	10.1	1.68	
MASSACHUSETTS	63	74	1.6	3.2	4.1	5.0	5.8	6.5	7.7	8.8	10.3	13.1	20.7	7.4	6.6	1.67	
MICHIGAN	63	151	.7	3.1	4.1	4.8	5.6	6.3	7.9	9.1	10.1	13.8	20.4	7.5	6.5	1.78	
MINNESOTA	63	77	1.1	2.0	2.7	3.2	4.1	4.9	6.4	7.0	8.2	10.9	33.0	6.3	5.0	1.96	
MISSISSIPPI	63	23	2.0	2.3	3.5	4.0	4.3	5.6	6.3	7.9	8.8	11.6	25.5	6.8	5.6	1.84	
MISSOURI	63	49	3.5	4.8	5.6	6.2	7.0	8.0	8.8	10.6	12.2	14.4	28.8	9.0	8.2	1.55	
MONTANA	63	26	.6	.9	1.0	1.3	1.5	2.0	2.5	2.7	3.8	7.4	13.2	3.2	2.2	2.26	
NEBRASKA	63	25	2.3	3.2	4.5	5.1	5.8	8.0	8.5	9.6	10.3	14.4	42.4	8.7	7.0	1.85	
NEVADA	63	46	3.3	4.6	5.2	6.5	7.4	8.6	10.3	12.8	15.7	20.0	35.4	11.1	9.2	1.83	
NEW JERSEY	63	149	.8	2.8	3.7	4.4	5.0	6.5	7.6	8.6	10.8	13.5	23.3	7.4	6.2	1.85	

TABLE 3-7. BENZENE SOLUBLE ORGANICS, URBAN, STATE AND NATIONAL (Continued)

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter													Std Geo Dev	
			Min	Frequency Distribution—Percent										Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90					
NEW MEXICO	63	25	3.5	4.9	5.6	6.7	7.4	8.0	8.4	9.6	11.3	23.6	43.3	10.7	8.8	1.80	
NEW YORK	63	289	.7	2.5	3.3	4.0	4.8	5.7	6.7	8.1	10.1	14.8	40.1	7.5	5.8	2.04	
NORTH CAROLINA	63	102	1.0	2.4	3.1	4.4	5.5	6.3	7.3	8.3	9.9	15.4	50.0	7.9	6.1	2.05	
NORTH DAKOTA	63	26	.9	1.9	2.8	3.1	3.3	3.5	3.8	4.1	4.5	6.9	9.5	4.0	3.5	1.68	
OHIO	63	231	1.2	3.8	4.7	5.4	6.2	7.2	8.3	9.8	11.9	15.9	44.5	8.9	7.5	1.78	
OKLAHOMA	63	25	1.9	2.2	2.5	3.0	3.2	3.7	3.9	4.4	4.9	6.3	7.9	3.9	3.6	1.47	
OREGON	63	69	.3	4.2	5.3	6.7	7.7	8.8	10.3	13.6	19.0	27.9	128.3	15.6	10.0	2.47	
PENNSYLVANIA	63	224	1.6	3.9	5.1	6.0	6.9	7.8	8.8	10.4	13.5	19.3	48.6	10.1	8.3	1.83	
RHODE ISLAND	63	46	3.2	3.9	4.3	5.1	5.6	6.2	6.9	7.4	8.3	9.3	41.8	7.7	6.5	1.65	
SOUTH CAROLINA	63	48	.9	3.0	3.5	3.9	4.4	4.9	5.3	6.0	6.9	8.8	30.7	6.0	5.1	1.74	
SOUTH DAKOTA	63	23	.2	.9	1.7	1.9	2.1	2.7	3.2	3.8	4.3	6.9	7.6	3.2	2.5	2.21	
TENNESSEE	63	99	1.7	4.3	5.8	7.2	8.1	9.0	10.1	13.1	15.7	20.7	40.9	11.2	9.5	1.79	
TEXAS	63	395	.8	2.4	3.1	3.6	4.2	4.8	5.4	6.1	7.5	10.1	29.1	5.8	4.9	1.77	
UTAH	63	25	1.8	2.5	3.5	4.3	4.7	5.1	5.8	8.3	10.9	20.0	26.3	7.5	5.8	2.01	
VERMONT	63	21	1.2	1.7	1.9	2.7	2.9	3.1	3.3	3.6	3.8	4.5	7.7	3.3	3.0	1.53	
VIRGINIA	63	123	.7	2.2	3.5	4.0	4.6	5.2	6.0	7.2	9.3	11.4	25.8	6.6	5.3	1.93	
WASHINGTON	63	50	1.8	2.8	3.8	4.7	5.6	6.5	7.2	8.8	9.9	13.7	24.6	7.5	6.4	1.78	
WEST VIRGINIA	63	26	2.6	4.6	4.8	5.2	5.6	6.6	7.4	9.3	10.9	12.2	18.8	7.8	7.0	1.60	
WISCONSIN	63	77	2.2	3.5	4.2	4.9	5.6	6.3	7.2	8.6	10.7	12.0	29.6	7.5	6.5	1.66	

TABLE 3-8. BENZENE SOLUBLE ORGANICS.
NONQUALIFYING STATIONS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
ARKANSAS LITTLE ROCK	63	19	1.6	18.7	6.0
CALIFORNIA MONTEREY	63	20	1.2	13.4	3.7
CONNECTICUT NEW BRITAIN	63	22	3.9	17.9	8.8
ILLINOIS ROCKFORD	63	23	2.0	22.0	6.5
KENTUCKY LEXINGTON	63	24	2.6	8.5	5.4
LOUISVILLE	63	20	1.5	33.5	10.1
LOUISIANA SHREVEPORT	63	22	1.3	28.4	8.6
MASSACHUSETTS SPRINGFIELD	63	18	3.0	20.3	9.1
NEW YORK ELMIRA	63	13	1.2	33.3	7.8
OKLAHOMA OKLAHOMA CITY	63	19	1.0	22.5	6.6
PUERTO RICO SAN JUAN	63	10	1.6	6.7	4.8
TEXAS BEAUMONT	63	16	1.3	11.7	6.8
HARLINGEN	63	20	.7	7.3	2.5
TEXAS CITY	63	21	1.5	4.8	3.1
VIRGINIA LYNCHBURG	63	22	7.4	21.8	12.4
WEST VIRGINIA WHEELING	63	20	4.6	31.8	14.7
WYOMING CHEYENNE	63	25	1.2	8.9	3.0

TABLE 3-9. BETA RADIOACTIVITY, MONTHLY MEANS AND EXTREMES BY STATE

(Picouries Per Cubic Meter)

Region or State	Years	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
NATIONAL	63 NUMBER	327	508	352	346	380	360	368	499	344	385	360	395
	MAXIMUM	32.2	25.6	47.2	42.6	32.0	49.3	28.5	18.2	8.5	5.8	8.4	4.9
	AVERAGE	8.9	9.6	10.2	13.2	10.4	10.8	6.4	4.6	2.7	2.4	1.6	1.1
	MINIMUM	0.9	0.1	0.7	1.0	0.4	1.0	0.2	0.3	0.1	0.2	0.1	0.0
ALABAMA	63 NUMBER	6	9	6	5	7	6	6	8	6	6	6	6
	MAXIMUM	11.1	16.6	13.8	16.3	19.8	15.8	10.5	10.5	5.1	3.8	2.7	2.1
	AVERAGE	5.4	12.2	8.6	15.0	14.1	12.0	5.6	5.2	3.1	2.7	2.2	1.3
	MINIMUM	0.8	6.6	2.5	12.9	7.8	7.4	3.1	1.2	0.2	1.8	0.9	0.4
ALASKA	63 NUMBER	2	5	4	4	5	4	4	6	4	4	4	2
	MAXIMUM	5.4	16.6	11.6	5.7	19.5	7.1	2.7	7.7	4.0	1.0	2.6	2.2
	AVERAGE	3.1	9.6	9.7	5.3	9.5	5.4	1.9	5.5	1.3	0.7	1.4	1.1
	MINIMUM	0.8	3.2	7.9	5.1	1.6	3.8	0.9	0.6	0.3	0.4	0.3	0.0
ARIZONA	63 NUMBER	7	10	8	8	9	7	8	12	8	8	8	8
	MAXIMUM	26.7	22.6	47.2	30.4	32.0	27.0	10.3	4.8	3.7	2.9	2.9	2.6
	AVERAGE	18.7	15.5	23.8	20.4	13.0	19.1	6.6	1.8	2.2	2.3	1.8	2.2
	MINIMUM	7.2	7.8	12.6	10.3	6.9	9.5	2.4	0.7	1.1	0.8	0.6	1.8
ARKANSAS	63 NUMBER		2	1	2	2	2	2	3	2	2	2	2
	MAXIMUM		10.6	4.7	19.2	13.0	8.9	4.3	4.3	2.6	2.7	2.0	1.9
	AVERAGE		9.6	4.7	17.8	13.0	8.4	3.7	3.7	2.3	2.6	1.9	1.7
	MINIMUM		8.5	4.7	16.4	12.9	3.8	3.1	2.5	2.0	2.4	1.8	1.4
CALIFORNIA	63 NUMBER	21	34	20	23	24	23	23	32	22	25	23	23
	MAXIMUM	32.2	25.2	16.0	25.0	27.0	13.2	10.8	9.9	4.9	4.5	2.4	2.7
	AVERAGE	19.3	8.7	9.9	10.0	10.4	6.3	4.4	4.7	2.3	2.4	1.6	1.2
	MINIMUM	3.6	2.7	3.1	3.4	2.9	1.6	2.7	0.3	0.5	1.3	1.0	0.4
COLORADO	63 NUMBER	5	8	6	6	4	6	7	8	5	6	6	5
	MAXIMUM	22.4	21.2	29.6	42.6	23.5	29.5	13.0	7.0	4.1	3.1	1.9	1.7
	AVERAGE	11.1	12.2	22.4	18.7	13.6	18.3	5.5	4.0	3.0	2.6	1.3	1.3
	MINIMUM	1.0	8.0	16.2	4.0	8.0	12.5	2.5	2.2	1.1	2.0	1.1	1.1
CONNECTICUT	63 NUMBER	8	12	8	8	8	8	8	11	8	7	7	8
	MAXIMUM	14.2	10.4	20.1	30.0	11.7	21.6	10.2	7.2	3.1	3.7	2.5	1.7
	AVERAGE	6.2	7.7	10.9	13.2	8.0	10.6	6.4	4.5	1.7	2.7	1.7	0.8
	MINIMUM	2.8	5.5	5.9	3.5	4.0	4.4	1.4	1.3	0.7	1.7	0.9	0.2
DELAWARE	63 NUMBER	4	5	1	5	3	3	5	5	2	4	5	4
	MAXIMUM	9.7	8.4	5.2	13.4	12.0	16.5	10.2	9.0	2.8	2.6	2.6	1.2
	AVERAGE	4.9	6.8	5.2	11.7	10.9	10.9	7.4	3.8	2.6	2.4	2.2	0.8
	MINIMUM	1.7	5.1	5.2	9.6	10.3	7.6	5.1	1.5	2.3	2.1	2.0	0.2
DIST. OF COL.	63 NUMBER	2	3	2	2	2	2	1	3	2	2	2	2
	MAXIMUM	3.3	11.2	28.5	13.8	13.3	14.0	6.5	7.7	4.3	1.9	2.2	1.0
	AVERAGE	2.9	9.4	17.2	13.5	12.4	13.0	4.5	5.4	3.5	1.8	2.1	0.6
	MINIMUM	2.4	6.7	5.8	13.2	11.4	9.9	6.5	3.9	2.6	1.7	2.0	0.2
FLORIDA	63 NUMBER	9	13	10	8	10	9	10	14	7	11	10	9
	MAXIMUM	18.7	16.6	19.3	23.4	15.6	9.7	8.9	9.6	4.7	3.5	2.2	3.7
	AVERAGE	9.3	11.4	10.2	18.0	9.9	6.1	5.3	4.0	2.4	2.2	1.9	2.2
	MINIMUM	4.3	4.7	4.2	10.2	3.8	2.5	2.9	1.0	0.4	1.3	1.4	0.2
GEORGIA	63 NUMBER	6	9	5	5	7	6	5	8	7	7	6	6
	MAXIMUM	10.2	16.0	11.8	17.9	19.2	15.1	4.6	4.3	4.4	3.3	2.2	2.0
	AVERAGE	6.3	10.2	8.7	14.3	12.2	11.2	3.9	3.5	2.5	2.4	1.8	1.3
	MINIMUM	0.5	4.2	5.3	11.3	6.9	2.7	3.2	3.0	0.1	1.7	1.2	0.5
HAWAII	63 NUMBER	4	6	4	4	4	3	4	4	4	4	4	4
	MAXIMUM	6.7	12.8	4.1	7.3	9.7	5.6	2.9	4.5	3.8	2.2	1.2	1.4
	AVERAGE	5.5	9.2	3.9	5.5	6.0	3.7	2.2	2.9	2.9	1.3	1.0	0.8
	MINIMUM	4.5	6.5	3.3	4.3	3.6	1.8	1.4	1.9	1.8	0.5	0.8	0.5
IDAHO	63 NUMBER	4	6	4	3	4	3	4	5	3	4	4	4
	MAXIMUM	26.5	17.0	22.9	30.0	25.3	9.4	18.9	18.2	4.7	4.4	1.5	1.5
	AVERAGE	15.2	11.0	16.0	18.7	13.4	7.2	16.3	9.6	3.5	4.0	1.3	1.1
	MINIMUM	8.5	6.5	8.1	10.2	6.5	2.8	13.6	3.0	2.1	3.3	0.9	0.7
ILLINOIS	63 NUMBER	8	10	7	6	9	8	7	11	7	9	7	7
	MAXIMUM	12.4	11.5	10.9	16.0	16.4	27.3	28.5	12.4	6.7	4.7	1.2	0.9
	AVERAGE	8.1	8.3	7.0	11.3	10.8	14.4	10.9	5.8	3.3	2.7	0.7	0.8
	MINIMUM	2.6	5.7	4.2	4.8	5.9	7.4	5.0	1.8	1.5	0.9	0.2	0.6
INDIANA	63 NUMBER	11	18	13	11	16	14	12	18	14	15	12	13
	MAXIMUM	16.8	16.5	20.7	18.1	16.4	22.6	12.1	9.3	6.2	5.8	8.4	1.4
	AVERAGE	8.6	9.2	10.6	12.6	8.5	16.0	8.7	5.3	3.0	2.8	1.9	0.9
	MINIMUM	3.3	5.4	3.2	4.6	0.4	10.5	2.2	1.7	1.1	0.9	0.4	0.5

TABLE 3-9. BETA RADIOACTIVITY, MONTHLY MEANS AND EXTREMES BY STATE (Continued)

(Picrocuries Per Cubic Meter)

Region or State	Years	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
IOWA	63	NUMBER	8	11	8	8	7	9	11	8	8	8	8
		MAXIMUM	12.8	15.5	8.1	22.6	15.0	49.3	9.8	8.5	3.2	4.6	1.6
		AVERAGE	8.1	8.3	4.9	11.8	10.2	15.7	7.1	5.1	2.3	2.2	0.9
		MINIMUM	2.3	5.4	2.2	7.4	1.3	6.8	3.1	1.0	1.4	0.7	0.4
KANSAS	63	NUMBER	4	6	4	4	4	4	6	4	4	4	4
		MAXIMUM	12.9	17.0	14.9	19.0	10.7	7.0	8.7	3.9	2.9	4.4	2.1
		AVERAGE	7.3	10.9	9.8	14.3	9.9	5.7	7.4	3.0	2.1	2.9	1.5
		MINIMUM	3.2	8.3	4.8	10.0	9.2	4.2	6.4	1.8	1.5	1.3	0.9
LOUISIANA	63	NUMBER	2	3	2	2	2	2	3	2	2	2	2
		MAXIMUM	8.5	14.7	15.2	15.4	17.5	6.7	9.4	5.0	4.2	4.1	1.8
		AVERAGE	5.0	11.0	10.4	14.4	14.2	5.2	7.0	3.3	3.1	3.1	1.8
		MINIMUM	1.4	8.1	5.5	13.4	10.8	3.6	4.5	1.8	1.9	2.1	1.7
MAINE	63	NUMBER	4	5	3	2	5	3	4	4	4	4	4
		MAXIMUM	6.3	10.8	15.5	10.8	8.8	11.6	6.5	12.0	2.3	2.7	2.0
		AVERAGE	4.4	8.9	12.2	7.5	6.7	5.8	4.3	4.8	2.0	2.2	1.4
		MINIMUM	2.2	6.6	9.4	4.2	5.4	1.0	3.4	2.1	1.5	1.9	0.8
MARYLAND	63	NUMBER	6	16	14	13	14	18	17	14	14	13	11
		MAXIMUM	6.5	13.8	19.6	15.1	15.4	15.0	14.6	8.5	4.4	2.6	2.7
		AVERAGE	3.9	6.2	7.4	8.0	5.6	8.4	3.9	3.0	2.5	1.5	1.5
		MINIMUM	1.9	0.1	0.8	1.7	0.5	1.5	0.4	0.6	1.4	0.8	0.1
MASSACHUSETTS	63	NUMBER	5	8	5	6	6	5	8	7	6	6	6
		MAXIMUM	8.7	16.7	14.8	26.4	11.4	29.6	14.9	16.3	3.3	3.9	2.5
		AVERAGE	5.2	9.2	10.5	16.0	8.2	14.3	10.7	6.4	2.0	2.8	1.5
		MINIMUM	2.4	5.5	6.4	9.0	3.1	4.1	7.7	1.8	0.6	1.5	0.7
MICHIGAN	63	NUMBER	11	15	11	13	11	12	12	17	10	14	12
		MAXIMUM	10.8	17.3	15.5	18.5	11.8	21.3	13.6	17.8	3.2	4.2	2.2
		AVERAGE	7.8	7.5	8.7	10.2	6.8	15.1	9.1	5.9	1.8	2.3	1.3
		MINIMUM	4.1	4.0	4.3	2.8	3.2	9.8	6.3	2.5	1.0	0.7	0.4
MINNESOTA	63	NUMBER	6	9	4	7	6	6	9	6	6	6	6
		MAXIMUM	9.3	8.3	7.7	16.4	13.7	20.9	11.5	9.2	2.6	4.2	3.3
		AVERAGE	5.5	7.2	5.0	11.5	11.0	14.0	8.6	5.8	1.8	2.2	1.2
		MINIMUM	1.5	5.1	3.7	7.3	6.5	1.8	6.9	3.3	0.9	0.3	0.4
MISSISSIPPI	63	NUMBER	2	2	1	1	3	2	1	3	1	3	2
		MAXIMUM	8.5	12.5	18.4	12.4	18.4	13.5	7.2	8.6	5.1	3.4	2.6
		AVERAGE	5.5	12.3	18.4	12.4	15.7	9.2	7.2	4.8	3.1	3.1	2.0
		MINIMUM	2.5	12.0	18.4	12.4	11.7	4.9	7.2	2.7	3.1	2.7	1.3
MISSOURI	63	NUMBER	5	7	7	5	5	6	5	8	4	6	6
		MAXIMUM	14.8	17.2	17.8	18.0	14.0	12.2	9.2	5.6	2.6	4.3	2.3
		AVERAGE	9.3	11.7	9.5	13.5	12.7	8.8	8.1	4.1	1.8	2.7	1.4
		MINIMUM	4.2	8.8	3.7	8.2	11.8	3.6	6.1	0.7	1.3	1.1	0.5
MONTANA	63	NUMBER	3	2	5	4	4	4	6	4	3	3	5
		MAXIMUM	16.6	6.5	22.0	15.0	22.6	7.9	13.2	9.6	4.1	4.0	1.9
		AVERAGE	10.7	5.6	8.6	12.2	14.4	5.1	10.3	7.4	3.2	2.9	1.4
		MINIMUM	6.1	4.6	2.5	6.9	6.7	4.0	7.0	5.4	2.4	2.3	1.0
NEBRASKA	63	NUMBER	3	6	4	4	4	4	5	4	4	4	4
		MAXIMUM	12.1	13.7	20.4	18.2	10.6	12.3	13.3	7.1	3.0	5.3	2.2
		AVERAGE	8.6	10.7	9.9	10.8	9.2	9.4	11.0	5.0	2.4	3.2	1.4
		MINIMUM	1.7	9.0	2.7	1.0	7.8	6.1	7.8	2.3	1.5	0.6	0.8
NEVADA	63	NUMBER	5	9	6	5	6	5	7	5	7	7	6
		MAXIMUM	27.5	25.0	35.5	24.5	27.4	34.1	14.6	13.0	4.3	4.1	6.9
		AVERAGE	16.5	14.0	20.0	17.8	18.2	22.6	10.0	5.0	1.9	2.9	2.4
		MINIMUM	7.0	5.3	7.9	11.7	14.9	14.0	5.0	2.1	1.0	1.9	1.1
NEW HAMPSHIRE	63	NUMBER	1	2	1	2	2	1	2	1	2	2	2
		MAXIMUM	5.9	8.1	15.3	14.4	10.8	5.1	11.3	13.1	3.4	2.0	1.4
		AVERAGE	5.9	7.5	15.3	13.2	9.1	5.1	10.7	13.1	3.4	1.9	1.0
		MINIMUM	5.9	6.8	15.3	11.9	7.3	5.1	10.0	13.1	3.4	1.8	0.5
NEW JERSEY	63	NUMBER	10	16	10	11	12	12	16	11	13	12	12
		MAXIMUM	9.5	11.0	13.8	32.8	22.0	15.5	9.6	4.8	5.3	4.0	2.4
		AVERAGE	4.4	7.4	9.4	15.2	10.1	10.1	6.4	3.6	3.0	2.7	1.8
		MINIMUM	2.1	4.3	5.2	8.4	7.1	3.6	4.0	2.1	2.2	1.4	0.8
NEW MEXICO	63	NUMBER	2	3	2	2	2	1	2	3	2	2	2
		MAXIMUM	13.7	25.6	15.5	15.6	7.6	12.9	2.2	4.1	3.6	3.0	1.4
		AVERAGE	13.0	18.9	13.2	11.7	6.3	11.6	2.2	3.7	1.8	2.3	1.2
		MINIMUM	12.3	14.5	10.8	7.8	5.0	10.2	2.2	3.2	0.8	1.5	1.0

TABLE 3-9. BETA RADIOACTIVITY, MONTHLY MEANS AND EXTREMES BY STATE (Continued)

(PicoCurie Per Cubic Meter)

Region or State	Years	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
NEW YORK	63 NUMBER	10	15	14	12	12	12	12	16	10	12	11	11
	MAXIMUM	12.4	14.4	20.3	21.9	20.8	24.2	10.7	13.1	4.4	4.3	2.8	1.9
	AVERAGE	6.6	7.9	11.0	12.6	9.5	12.2	5.0	5.7	2.1	2.3	1.6	0.8
	MINIMUM	3.2	3.8	4.6	2.9	4.9	3.2	0.2	1.8	1.0	1.1	0.1	0.2
NORTH CAROLINA	63 NUMBER	12	20	13	12	16	14	16	17	14	15	13	14
	MAXIMUM	18.2	17.9	14.8	18.5	26.0	18.6	13.8	8.8	7.4	3.3	2.4	1.7
	AVERAGE	6.7	8.9	8.4	11.2	9.9	12.0	5.8	4.4	2.9	2.0	1.4	0.8
	MINIMUM	0.6	2.0	5.0	4.4	3.6	2.8	1.4	0.4	0.6	0.3	0.2	0.2
NORTH DAKOTA	63 NUMBER	4	6	4	3	4	5	4	5	4	4	3	4
	MAXIMUM	9.3	15.4	8.7	17.6	9.5	10.1	11.4	10.8	4.1	3.4	1.2	1.3
	AVERAGE	6.5	9.9	6.0	15.5	8.5	7.6	8.3	6.4	2.9	1.9	0.9	1.2
	MINIMUM	3.4	7.0	2.7	12.8	7.5	4.9	5.8	1.3	1.9	0.9	0.7	1.0
OHIO	63 NUMBER	18	27	18	17	18	18	18	26	18	17	17	19
	MAXIMUM	10.9	16.0	17.2	17.6	16.3	19.4	13.3	11.2	5.7	4.0	3.9	1.3
	AVERAGE	7.2	7.4	11.0	13.5	10.1	15.1	8.4	5.2	3.4	2.2	2.4	0.7
	MINIMUM	5.0	4.6	5.7	2.2	4.7	11.2	1.9	1.1	1.3	1.4	1.3	0.2
OKLAHOMA	63 NUMBER	4	5	4	3	5	4	4	5	4	4	4	3
	MAXIMUM	17.9	18.4	10.8	17.5	14.1	8.0	11.1	4.3	3.2	2.6	2.2	1.5
	AVERAGE	12.4	11.7	8.1	14.1	11.0	5.6	5.8	2.9	3.0	2.4	1.6	1.5
	MINIMUM	4.9	4.6	5.1	9.2	8.2	3.4	3.1	1.6	2.8	1.9	0.9	1.5
OREGON	63 NUMBER	4	8	5	5	7	6	8	4	6	7	6	5
	MAXIMUM	24.1	7.3	7.0	7.7	9.2	5.1	5.5	5.6	3.8	2.8	4.4	1.7
	AVERAGE	15.1	5.0	3.0	5.7	5.4	4.4	3.9	4.0	2.2	1.6	1.4	1.1
	MINIMUM	6.9	2.8	0.7	3.8	2.9	3.6	2.4	3.4	1.0	0.4	0.3	0.4
PENNSYLVANIA	63 NUMBER	15	29	18	18	20	20	18	29	17	22	18	21
	MAXIMUM	10.6	13.4	24.1	19.4	15.7	20.7	12.3	11.1	8.5	2.9	3.3	2.9
	AVERAGE	5.3	7.5	10.2	12.1	10.2	11.8	7.3	5.1	3.8	2.0	2.1	0.9
	MINIMUM	1.3	2.7	4.8	5.3	2.4	3.2	2.9	1.6	1.3	0.3	0.6	0.1
RHODE ISLAND	63 NUMBER	6	9	5	5	6	6	6	8	4	6	5	6
	MAXIMUM	10.6	11.4	13.6	24.6	10.0	17.1	9.2	8.5	3.0	3.3	2.5	1.8
	AVERAGE	5.8	8.9	9.7	14.4	9.1	10.3	7.2	4.7	2.4	2.8	1.7	1.1
	MINIMUM	3.0	5.7	7.3	9.8	8.1	2.9	4.4	1.8	1.0	2.2	0.6	0.3
SOUTH CAROLINA	63 NUMBER	6	8	5	6	6	6	6	6	5	6	5	6
	MAXIMUM	25.6	23.8	10.4	21.8	15.2	16.8	10.2	8.9	6.9	3.2	2.1	2.1
	AVERAGE	10.5	12.9	8.1	13.8	12.3	10.4	6.2	4.6	3.6	2.4	1.7	1.4
	MINIMUM	1.3	4.6	5.6	6.4	9.2	1.9	2.9	2.3	1.3	1.8	1.4	0.5
SOUTH DAKOTA	63 NUMBER	4	5	4	3	4	4	4	6	3	5	4	3
	MAXIMUM	10.0	11.5	25.1	13.5	13.7	23.0	12.4	10.1	2.5	4.4	1.4	1.3
	AVERAGE	8.4	9.2	14.5	9.0	11.1	12.4	9.4	6.0	2.0	2.5	0.8	1.1
	MINIMUM	5.6	7.5	3.3	4.6	7.6	4.8	5.6	2.1	1.4	0.2	0.4	1.0
TENNESSEE	63 NUMBER	7	12	7	9	8	7	9	12	7	9	7	5
	MAXIMUM	16.8	17.5	15.8	21.0	15.5	14.3	8.1	8.6	5.2	3.6	2.7	1.4
	AVERAGE	9.3	12.6	8.4	14.4	11.7	11.1	5.0	4.5	3.8	2.6	1.7	0.7
	MINIMUM	3.4	4.5	2.9	7.5	2.9	4.6	3.1	1.5	2.2	1.4	0.9	0.3
TEXAS	63 NUMBER	33	49	34	31	31	31	34	46	31	35	32	31
	MAXIMUM	20.2	23.7	16.1	28.9	19.2	13.2	4.7	7.6	5.1	5.3	3.7	3.6
	AVERAGE	10.8	13.2	10.6	18.9	12.6	5.5	3.0	3.3	2.9	2.9	1.9	1.5
	MINIMUM	5.5	1.1	3.9	2.7	4.6	1.5	0.9	1.3	1.1	1.2	1.0	0.5
UTAH	63 NUMBER	2	2	3	2	2	2	2	3	1	3		3
	MAXIMUM	19.8	19.2	18.0	18.9	26.4	21.8	10.1	3.5	1.4	4.2		1.6
	AVERAGE	14.9	16.5	12.7	14.9	21.1	20.7	7.3	2.8	1.4	3.0		1.5
	MINIMUM	10.0	13.7	5.0	10.8	15.7	19.5	4.4	2.0	1.4	2.2		1.3
VERMONT	63 NUMBER	4	4	4	4	3	4	4	4	3	3	9	4
	MAXIMUM	13.8	9.2	16.7	17.6	9.5	18.0	8.7	13.1	2.7	2.5	1.6	1.4
	AVERAGE	4.2	7.7	11.5	12.5	8.9	10.9	5.5	4.9	1.5	2.2	1.2	0.8
	MINIMUM	1.9	5.3	8.5	9.5	8.3	4.6	2.7	1.5	0.1	1.7	0.8	0.2
VIRGINIA	63 NUMBER	11	16	12	11	12	12	9	18	11	11	13	12
	MAXIMUM	16.8	15.3	20.3	17.2	18.1	14.7	12.3	8.8	5.3	3.8	3.5	1.2
	AVERAGE	6.4	10.0	9.6	12.0	10.2	11.6	6.9	4.4	3.4	2.3	2.0	0.7
	MINIMUM	3.1	5.7	2.8	5.3	5.0	8.4	2.3	1.2	1.8	1.2	1.3	0.2
WASHINGTON	63 NUMBER	3	6	4	4	4	4	4	6	4	3	5	3
	MAXIMUM	23.0	7.5	11.6	19.6	18.6	7.4	11.2	7.4	4.1	2.4	1.4	2.8
	AVERAGE	14.7	4.6	4.9	11.5	11.1	5.2	5.1	4.4	2.3	1.6	0.8	1.5
	MINIMUM	3.9	2.0	1.5	7.1	6.8	2.7	2.6	2.5	0.7	1.2	0.5	0.7

TABLE 3-9. BETA RADIOACTIVITY, MONTHLY MEANS AND EXTREMES BY STATE (Continued)

(Picocuries Per Cubic Meter)

Region or State	Years	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	
WEST VIRGINIA	63	NUMBER	2	3	2	2	2	2	3	2	2	2	2	
		MAXIMUM	10.8	11.4	14.2	21.4	11.4	18.0	8.9	5.3	4.6	3.0	1.8	1.2
		AVERAGE	9.3	9.8	10.2	14.0	10.7	16.3	6.8	3.0	4.2	2.9	1.6	0.8
		MINIMUM	7.8	8.6	6.1	6.5	10.0	14.5	4.7	1.1	3.7	2.7	1.4	0.4
WISCONSIN	63	NUMBER	7	12	8	9	8	8	11	7	8	8	7	
		MAXIMUM	10.2	9.3	10.7	17.8	12.0	18.7	11.1	10.1	2.5	4.6	1.8	1.5
		AVERAGE	6.8	8.0	7.6	10.6	8.3	15.6	9.0	6.5	1.8	2.1	1.0	1.1
		MINIMUM	2.8	5.3	4.1	3.8	5.3	10.6	7.0	2.9	1.1	0.5	0.5	0.9
WYOMING	63	NUMBER	1	2	2	1	3	1	2	3	2	1	3	
		MAXIMUM	12.1	10.7	19.4	24.6	19.9	15.4	17.4	12.4	3.9	4.9	1.6	1.7
		AVERAGE	12.1	7.7	17.7	24.6	16.5	15.4	14.8	7.8	2.9	4.9	1.1	1.7
		MINIMUM	12.1	4.6	15.9	24.6	10.8	15.4	12.1	5.3	1.9	4.9	0.7	1.7

TABLE 3-10. NITRATES, URBAN, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA BURBANK	60	26	2.1	2.6	4.8	6.9	7.4	8.8	11.6	12.3	14.7	15.4	18.2	9.4	8.0	1.90	
PASADENA	62	24	2.4	3.8	5.0	5.4	6.1	6.6	7.8	10.6	11.7	14.3	17.8	8.1	7.2	1.65	
SANTA BARBARA	62	25	.4	.8	1.6	2.3	2.6	3.5	3.8	5.4	6.6	9.9	18.0	4.5	3.2	2.49	
ILLINOIS CHICAGO	62	26	.2	.2	.4	.5	.8	.9	1.2	1.3	2.2	2.3	3.3	1.2	.9	2.29	
CICERO	62	19	.6	.6	1.0	1.3	1.6	2.1	2.5	3.0	3.3	5.4	7.9	2.6	2.0	2.17	
INDIANA INDIANAPOLIS	62	26	.7	.9	1.1	1.3	1.4	1.6	2.0	2.2	2.6	2.9	3.3	1.8	1.7	1.56	
MARYLAND BALTIMORE	62	26	.5	.7	1.0	1.3	1.4	1.5	1.8	2.1	2.4	2.6	4.1	1.8	1.5	1.75	
MASSACHUSETTS BOSTON	61	25	.1	.2	.3	.4	.6	.8	1.0	1.5	1.6	1.8	2.2	1.0	.7	2.27	
	62	23			.1	.3	.4	.5	.7	.8	.9	1.4	1.8	.6	.4	3.14	
	61 62	48			.1	.3	.3	.4	.6	.8	1.0	1.4	1.6	2.2	.8	.5	2.80
MISSOURI ST LOUIS	62	25	.6	.7	.8	1.1	1.2	1.4	1.7	2.0	2.6	3.6	4.0	1.7	1.5	1.76	
NEBRASKA OMAHA	62	25	.1	.3	.4	.8	1.0	1.3	1.4	1.8	2.0	4.3	5.5	1.6	1.1	2.82	
NEW JERSEY NEWARK	62	25	.2	.5	.7	1.1	1.2	1.4	1.5	2.1	2.6	3.6	4.3	1.7	1.3	2.15	
NEW YORK ALBANY	63	26	.5	.9	1.2	1.4	1.6	2.2	2.5	3.0	5.4	7.4	9.1	3.1	2.3	2.15	
BINGHAMTON	63	22	.9	1.0	1.1	1.3	2.1	2.2	2.4	2.6	3.4	3.7	4.8	2.3	2.1	1.64	
MT VERNON	63	26	.5	.6	.8	1.1	1.5	1.8	2.9	3.3	3.7	4.3	4.9	2.3	1.8	2.09	
NEW YORK SCHENECTADY	62	25	.2	.2	.3	.6	.7	.9	1.5	2.0	2.3	3.3	4.3	1.4	1.0	2.50	
SYRACUSE	63	26	.2	.8	.9	1.3	1.7	2.3	3.8	4.0	4.3	4.8	6.9	2.8	2.1	2.30	
UTICA	63	26	.5	1.1	1.5	1.7	2.4	3.3	4.0	4.2	4.5	4.7	5.4	3.1	2.6	1.91	
NORTH CAROLINA WINSTON SALEM	63	26	.6	.8	1.4	1.5	1.6	2.0	2.6	3.0	5.0	5.4	9.1	2.9	2.3	2.03	
OHIO COLUMBUS	62	26	.3	.5	.6	.9	1.0	1.2	1.2	1.3	1.4	1.6	2.6	1.2	1.1	1.65	
OKLAHOMA OKLAHOMA CITY	62	25	.6	.6	1.3	1.6	1.7	1.8	2.0	2.6	3.3	4.8	6.4	2.4	2.0	1.89	
PENNSYLVANIA PHILADELPHIA	62	23	.5	.6	.8	.9	.9	1.0	1.4	1.5	1.6	1.7	2.4	1.2	1.1	1.49	
PITTSBURGH	62	26	.1	.2	1.1	1.3	2.1	2.3	2.5	2.9	3.8	5.4	10.0	2.7	1.9	2.76	
			.6	1.4	1.8	2.1	2.3	2.5	2.8	3.3	3.6	3.8	6.1	2.7	2.5	1.61	

TABLE 3-11. NITRATES, URBAN, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	62	12	5.3	24.7	12.7
	63	13	2.7	16.0	7.7
	62 63	25	2.7	24.7	10.1
SAN FRANCISCO	62	13	.3	5.4	1.7
	63	12	.5	9.4	3.2
	62 63	25	.3	9.4	2.4
SANTA BARBARA	63	12	.5	8.9	4.1
COLORADO DENVER	62	13	.4	6.2	1.5
	63	12	.4	21.2	2.6
	62 63	25	.4	21.2	2.0
DIST. OF COL. WASHINGTON	62	11	.8	2.4	1.7
	63	13	.5	5.6	2.4
	62 63	24	.5	5.6	2.0
GEORGIA ATLANTA	62	12	.8	3.7	2.1
	63	12	1.0	3.4	2.0
	62 63	24	.8	3.7	2.0
ILLINOIS CHICAGO	63	12	.1	5.9	1.7
LOUISIANA NEW ORLEANS	62	13	.7	4.6	2.3
	63	12	1.3	4.2	2.4
	62 63	25	.7	4.6	2.4
MICHIGAN DETROIT	62	12	.2	9.5	2.4
	63	12	.3	3.4	1.7
	62 63	24	.2	9.5	2.0
MISSOURI ST LOUIS	63	12	.8	3.6	1.7
NEBRASKA OMAHA	63	12	.2	4.0	1.4
NEW JERSEY NEWARK	63	12	.2	7.2	2.0
NEW YORK NEW YORK	63	12	.6	6.5	3.2
OHIO CINCINNATI	62	12	.4	3.0	1.7
	63	12	.8	4.5	1.7
	62 63	24	.4	4.5	1.7
CLEVELAND	62	13	.1	2.4	1.2
	63	12	1.2	5.3	3.0
	62 63	25	.1	5.3	2.0
OKLAHOMA OKLAHOMA CITY	63	10	1.0	3.8	2.1
PENNSYLVANIA PHILADELPHIA	63	12	1.1	6.5	2.9
	63	12	.4	8.5	2.9
WASHINGTON SEATTLE	62	13	.2	3.9	1.3
	63	12	.2	1.3	.7
	62 63	25	.2	3.9	1.0

TABLE 3-12. NITRATES, NONURBAN, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
ALASKA PT WORONZOF	62	25					.1	.1	.1	.1	.2	.3	.7	.1	.1	2.14	
ARIZONA GRAND CANYON PK	62	26		.1	.1	.2	.2	.3	.3	.4	.5	.6	1.1	.3	.3	2.28	
FLORIDA FLORIDA KEYS	62	25	.1	.2	.3	.5	.7	.9	1.0	1.0	1.1	1.6	2.4	.9	.7	2.18	
INDIANA PARKE COUNTY	62	25	.4	.6	.9	1.1	1.5	1.7	1.8	2.2	3.0	4.3	5.9	2.1	1.7	1.97	
IOWA DELAWARE COUNTY	62	22		.2	.3	.7	1.0	1.1	1.3	1.8	3.0	4.8	9.5	1.9	1.1	3.31	
MAINE ACADIA NAT PARK	62	24		.1	.1	.2	.3	.5	.9	1.2	1.4	2.6	4.4	1.0	.5	3.36	
MARYLAND CALVERT COUNTY	62	24	.3	.3	.7	.9	1.1	1.2	1.3	1.5	1.7	2.2	2.7	1.3	1.1	1.76	
MONTANA GLACIER NAT PARK	62	24					.1	.1	.1	.1	.1	.2	.3	.1	.1	1.96	
NORTH CAROLINA CAPE HATTERAS	62	23	.5	.6	.8	.9	1.0	1.2	1.4	1.6	1.7	2.0	2.3	1.3	1.2	1.53	
PENNSYLVANIA CLARION COUNTY	62	21	.2	.3	.5	.6	.7	.9	.9	1.1	1.3	1.6	2.0	.9	.8	1.80	
VIRGINIA SHENANDOAH PARK	62	26	.2	.3	.4	.6	.6	.7	.7	.8	1.0	1.1	1.8	.8	.7	1.67	

TABLE 3-13. SULFATES, URBAN, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA BURBANK	60	26	3.9	4.7	5.5	7.1	10.2	12.8	14.0	15.2	19.0	24.1	41.8	13.7	11.3	1.91	
PASADENA	62	24	2.0	2.6	5.5	6.4	12.0	17.0	18.3	21.1	24.1	35.2	49.1	16.9	12.3	2.41	
SANTA BARBARA	62	25	1.5	1.8	2.2	2.6	4.1	5.1	5.4	6.4	8.2	10.2	14.8	5.5	4.5	1.98	
ILLINOIS CHICAGO	62	26	4.7	7.5	8.4	9.7	11.1	14.0	15.7	19.0	22.2	25.9	38.3	15.5	13.5	1.71	
CICERO	62	19	6.4	8.2	9.5	12.0	14.8	16.3	17.0	18.3	20.6	24.1	30.8	15.9	14.7	1.53	
INDIANA INDIANAPOLIS	62	26	5.4	6.1	7.8	8.8	10.2	11.3	12.5	13.5	16.3	17.7	22.8	11.8	11.1	1.47	
MARYLAND BALTIMORE	62	26	6.5	7.5	9.7	11.1	12.0	15.2	17.2	19.0	30.2	33.5	56.2	19.1	16.0	1.81	
MASSACHUSETTS BOSTON	61 62 61 62	25 23 48	8.4 5.9 5.9	9.2 8.8 9.1	9.9 11.4 10.5	11.1 12.3 11.5	12.0 12.9 12.7	16.3 13.7 13.8	18.1 16.3 17.2	20.6 18.1 19.4	22.2 19.6 20.8	30.2 21.6 24.1	36.2 76.2 76.2	17.0 17.0 17.0	15.5 14.7 15.1	1.55 1.62 1.58	
MISSOURI ST LOUIS	62	25	4.2	6.4	12.0	12.9	13.4	14.6	15.7	18.1	19.8	22.2	24.3	14.6	13.4	1.60	
NEBRASKA OMAHA	62	25	1.1	2.1	2.6	3.1	3.3	3.5	3.8	4.7	5.5	10.2	16.8	4.8	3.9	1.84	
NEW JERSEY NEWARK	62	25	6.4	9.5	10.8	12.4	13.2	14.8	16.3	22.2	24.7	30.2	58.7	17.9	15.7	1.66	
NEW YORK ALBANY	63	26	4.4	5.5	6.8	7.8	8.5	10.2	11.6	12.4	13.6	19.0	24.6	11.1	10.1	1.57	
BINGHAMTON	63	22	3.7	4.1	4.7	6.4	7.5	8.4	9.5	10.7	12.0	16.3	29.5	9.6	8.4	1.67	
MT VERNON	63	26	3.3	4.4	5.1	7.8	8.5	10.2	13.3	15.2	19.0	25.9	54.3	13.6	10.7	2.02	
NEW YORK	62	25	13.2	16.3	17.4	19.0	22.2	24.1	25.3	30.2	33.5	41.1	43.2	25.3	23.8	1.41	
SCHENECTADY	63	26	3.3	5.1	6.0	6.8	7.3	8.8	11.4	12.7	15.2	17.7	24.5	10.7	9.5	1.67	
SYRACUSE	63	26	3.5	4.7	5.5	6.8	7.3	8.4	10.7	11.6	14.6	15.7	26.9	10.1	8.9	1.65	
UTICA	63	26	.8	4.7	6.6	7.3	8.8	9.5	10.2	12.7	14.6	15.7	21.8	10.1	8.8	1.90	
NORTH CAROLINA WINSTON SALFM	62	26	3.0	4.1	5.5	6.2	7.0	8.8	10.7	11.6	12.8	13.6	21.1	9.2	8.2	1.66	
OHIO COLUMBUS	62	25	2.9	5.5	6.4	9.4	9.9	11.1	12.0	14.0	16.3	22.2	33.6	12.5	10.9	1.72	
OKLAHOMA OKLAHOMA CITY	62	23	.9	1.1	1.5	1.7	1.9	2.3	2.6	3.3	3.8	6.0	6.9	2.9	2.5	1.74	
PENNSYLVANIA PHILADELPHIA	62	24	6.4	8.8	13.3	14.6	16.3	18.1	20.6	24.7	28.1	35.2	44.3	20.7	18.5	1.63	
PITTSBURGH	62	26	6.7	10.2	11.1	13.0	15.2	17.4	19.0	19.9	21.3	22.2	33.1	17.3	16.2	1.45	

TABLE 3-14. SULFATES, URBAN, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	62	12	8.9	33.8	20.9
	63	13	2.5	19.4	8.3
	62 63	25	2.5	33.8	14.3
SAN FRANCISCO	62	13	2.0	22.5	7.8
	63	12	1.4	23.3	7.0
	62 63	25	1.4	23.3	7.4
SANTA BARBARA	63	12	1.9	10.5	4.6
COLORADO DENVER	62	13	.8	5.3	1.9
	63	12	1.1	15.2	3.7
	62 63	25	.8	15.2	2.8
DIST. OF COL. WASHINGTON	62	11	5.8	19.2	10.6
	63	13	8.6	22.9	16.2
	62 63	24	5.8	22.9	13.6
GEORGIA ATLANTA	62	12	1.5	13.6	5.6
	63	12	2.6	12.3	6.3
	62 63	24	1.5	13.6	5.9
ILLINOIS CHICAGO	63	12	14.5	34.9	21.5
LOUISIANA NEW ORLEANS	62	13	4.1	10.3	7.0
	63	12	5.5	11.0	8.2
	62 63	25	4.1	11.0	7.6
MICHIGAN DETROIT	62	12	5.4	22.7	9.9
	63	12	5.3	19.2	10.4
	62 63	24	5.3	22.7	10.2
MISSOURI ST LOUIS	63	12	3.6	23.4	13.1
NEBRASKA OMAHA	63	12	1.5	12.2	4.8
NEW JERSEY NEWARK	63	12	3.7	61.4	19.8
NEW YORK NEW YORK	63	12	24.4	74.2	43.3
OHIO CINCINNATI	62	12	4.7	21.9	10.2
	63	12	3.9	15.6	10.0
	62 63	24	3.9	21.9	10.1
CLEVELAND	62	13	4.1	25.4	14.0
	63	12	8.6	29.2	16.8
	62 63	25	4.1	29.2	15.4
OKLAHOMA OKLAHOMA CITY	63	10	3.0	8.7	4.7
PENNSYLVANIA PHILADELPHIA	63	12	8.5	38.4	23.1
	63	12	8.8	29.0	17.9
WASHINGTON SEATTLE	62	13	3.5	11.0	5.9
	63	12	3.4	13.9	6.2
	62 63	25	3.4	13.9	6.0

TABLE 3-15. SULFATES, NONURBAN, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
ALASKA PT WORONZOF	62	25					.1	.1	.1	.4	.5	.7	3.0	.3	.1	3.67	
ARIZONA GRAND CANYON PK	62	26	.5	.8	.9	1.0	1.2	1.5	1.8	2.1	3.0	3.5	4.1	1.9	1.6	1.80	
FLORIDA FLORIDA KEYS	62	25	1.2	1.5	1.6	2.4	2.5	2.8	3.0	3.7	4.1	5.5	5.7	3.0	2.8	1.56	
INDIANA PARKE COUNTY	62	25	2.8	4.7	6.4	7.1	7.5	8.5	9.5	12.0	13.0	15.2	17.6	9.2	8.4	1.58	
IOWA DELAWARE COUNTY	62	22	.4	2.2	2.6	3.5	5.8	6.4	7.1	7.8	8.8	14.0	22.3	7.3	5.4	2.38	
MAINE ACADIA NAT PARK	62	24	1.6	1.8	2.6	3.3	4.1	5.5	7.8	8.8	9.5	12.0	18.4	6.6	5.3	2.00	
MARYLAND CALVERT COUNTY	62	24	4.4	4.8	5.2	5.5	6.4	6.7	7.0	7.5	10.2	14.0	16.4	7.9	7.3	1.46	
MONTANA GLACIER NAT PARK	62	24		.1	.2	.3	.5	.5	.6	1.0	1.2	2.2	3.5	.9	.5	3.22	
NORTH CAROLINA CAPE HATTERAS	62	23	4.6	4.5	5.5	6.8	7.5	9.2	9.9	10.6	11.3	15.2	18.0	9.2	8.5	1.50	
PENNSYLVANIA CLARION COUNTY	62	21	3.6	4.7	5.8	6.4	7.8	8.5	9.5	11.1	14.0	16.3	23.1	9.9	8.8	1.63	
VIRGINIA SHENANDOAH PARK	62	26	2.5	3.9	4.3	5.0	5.5	8.8	9.5	10.0	12.5	13.5	15.3	8.3	7.4	1.67	

TABLE 3-16. ARSENIC, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
ARIZONA PHOENIX	61	27				.01	.01	.01	.01	.02	.03	.04	.11	.02	.01	2.63	
DELAWARE WILMINGTON	61	23				.01	.01	.01	.01	.01	.02	.02	.03	.01	.01	1.69	
DIST. OF COL. WASHINGTON	61	23				.01	.01	.01	.01	.02	.02	.03	.04	.02	.01	1.79	
GEORGIA ATLANTA	62	25						.01	.01	.01	.01	.02	.04	.01	.01	1.81	
ILLINOIS CHICAGO	62	26				.01	.01	.01	.02	.02	.03	.03	.04	.02	.02	1.91	
INDIANA GARY	62	21			.01	.01	.02	.02	.03	.04	.04	.06	.08	.03	.02	2.29	
PARKE COUNTY	61	23						.01	.01	.01	.01	.01	.02		.01	1.59	
NEW YORK NEW YORK	61	23	.01	.01	.01	.02	.02	.02	.03	.03	.04	.05	.11	.03	.03	1.85	
PENNSYLVANIA CLARION COUNTY	61	22					.01	.01	.01	.01	.01	.02	.03	.01	.01	1.56	
PITTSBURGH	61	23	.01		.01	.01	.01	.02	.02	.03	.03	.05	.09	.03	.02	1.87	
UTAH SALT LAKE CITY	61	18				.01	.01	.01	.01	.02	.02	.02	.11	.02	.01	2.39	
WEST VIRGINIA CHARLESTON	62	25		.01	.03	.05	.08	.20	.22	.36	.38	.53	1.00	.24	.11	4.84	

TABLE 3-17, CHROMIUM, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61 62 61 62	26 24 50		.012 .001 .001	.013 .001 .012	.015 .012 .014	.016 .016 .016	.017 .019 .017	.018 .026 .019	.018 .029 .022	.021 .039 .029	.026 .060 .039	.032 .086 .086	.018 .026 .022	.015 .012 .014	2.13 5.78 3.76	
ILLINOIS CICERO	62	19	.003	.005	.008	.009	.013	.017	.018	.019	.026	.041	.045	.018	.014	2.10	
INDIANA INDIANAPOLIS	62	25			.001	.001	.006	.008	.010	.017	.026	.049	.068	.016	.005	6.18	
MARYLAND BALTIMORE	61 62 61 62	26 25 51	.031	.034 .019 .026	.037 .026 .031	.052 .029 .036	.066 .034 .041	.073 .039 .061	.079 .045 .069	.105 .063 .079	.121 .069 .105	.212 .105 .139	.430 .170 .430	.108 .051 .080	.081 .037 .055	2.07 2.93 2.68	
NEBRASKA OMAHA	59 62 59 62	21 25 46	.009	.017 .001 .001	.018 .001 .005	.022 .005 .007	.026 .006 .010	.030 .007 .018	.032 .008 .025	.034 .011 .029	.037 .024 .033	.069 .032 .037	.085 .043 .085	.033 .011 .021	.029 .005 .011	1.68 4.85 4.51	
NEW JERSEY NEWARK	62	26		.001	.001	.006	.007	.010	.015	.019	.045	.056	.069	.020	.008	5.69	
NEW YORK BUFFALO	62	24					.001	.001	.001	.011	.022	.034	.059	.010	.002	6.93	
NORTH CAROLINA WINSTON SALEM	62	26		.008	.010	.011	.012	.016	.019	.020	.021	.024	.030	.016	.014	2.18	
OHIO CINCINNATI	60 62 60 62	23 24 47	.037 .011 .011	.039 .011 .013	.056 .013 .018	.069 .015 .037	.073 .019 .045	.079 .029 .069	.087 .039 .076	.096 .069 .091	.105 .110 .111	.139 .184 .139	.200 .260 .260	.086 .063 .074	.078 .036 .053	1.55 2.82 2.42	
COLUMBUS	62	25		.009	.010	.012	.012	.013	.018	.020	.021	.034	.052	.017	.013	2.91	
OKLAHOMA OKLAHOMA CITY	62	22				.001	.001	.001	.001	.004	.005	.005	.007	.002	.001	3.25	
PENNSYLVANIA PHILADELPHIA	60 62 60 62	24 24 48	.018	.019 .001 .001	.025 .001 .001	.028 .001 .017	.034 .001 .021	.037 .014 .025	.041 .017 .032	.052 .022 .038	.069 .025 .045	.110 .039 .091	.120 .100 .120	.049 .018 .034	.042 .005 .014	1.79 7.62 6.26	

TABLE 3-18. COPPER, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61	26	.04	.05	.05	.06	.06	.06	.07	.07	.09	.10	.13	.07	.07	1.36	
	62	24	.03	.03	.05	.06	.07	.08	.08	.10	.12	.15	.43	.10	.08	1.77	
	61 62	50	.03	.04	.05	.06	.06	.07	.07	.08	.10	.13	.43	.09	.08	1.58	
ILLINOIS CICERO	62	19	.02	.02	.04	.06	.07	.08	.09	.10	.11	.13	.16	.08	.07	1.84	
INDIANA INDIANAPOLIS	62	25	.02	.02	.03	.05	.06	.08	.10	.11	.14	.16	.18	.09	.07	1.97	
MARYLAND BALTIMORE	61	26	.05	.08	.08	.09	.11	.13	.14	.14	.15	.16	.18	.12	.12	1.39	
	62	25	.04	.04	.05	.06	.06	.07	.07	.10	.12	.24	.32	.10	.08	1.77	
	61 62	51	.04	.05	.06	.07	.08	.10	.12	.13	.15	.17	.32	.11	.10	1.65	
NEBRASKA OMAHA	59	21	.01	.02	.03	.03	.03	.04	.05	.07	.13	.62	1.60	.20	.07	3.66	
	62	25	.01	.01	.02	.02	.03	.03	.04	.04	.05	.07	.12	.04	.04	1.72	
	59 62	46	.01	.02	.02	.03	.03	.03	.04	.05	.06	.12	1.60	.12	.05	2.75	
NEW JERSEY NEWARK	62	26	.02	.02	.02	.06	.07	.09	.10	.10	.14	.15	.29	.09	.07	2.22	
NEW YORK BUFFALO	62	24	.03	.03	.05	.06	.07	.07	.11	.14	.15	.20	.39	.11	.09	1.99	
NORTH CAROLINA WINSTON SALEM	62	26	.02	.03	.04	.04	.05	.05	.06	.06	.07	.08	.09	.06	.05	1.44	
OHIO CINCINNATI	60	23	.04	.04	.06	.07	.07	.09	.10	.11	.14	.22	.30	.11	.09	1.71	
	62	24	.03	.03	.03	.04	.04	.05	.05	.06	.06	.09	.14	.06	.05	1.44	
	60 62	47	.03	.03	.04	.04	.05	.06	.07	.08	.10	.14	.30	.08	.07	1.72	
COLUMBUS	62	25	.03	.03	.06	.06	.07	.09	.11	.15	.17	.86	9.30	.24	.14	3.59	
OKLAHOMA OKLAHOMA CITY	62	22	.01	.01	.01	.02	.02	.03	.03	.04	.06	.07	.11	.04	.03	1.80	
PENNSYLVANIA PHILADELPHIA	60	24	.02	.02	.03	.04	.06	.06	.07	.10	.11	.16	.30	.08	.07	1.99	
	62	24	.02	.03	.04	.05	.06	.06	.07	.08	.09	.14	.19	.08	.07	1.67	
	60 62	48	.02	.03	.04	.04	.05	.06	.08	.09	.10	.14	.30	.08	.07	1.82	

TABLE 3-19. IRON, FULL YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter											Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent													
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61	26	1.0	1.3	1.5	1.6	1.8	2.0	2.4	2.9	3.5	4.6	8.4	2.6	2.3	1.65	
	62	24	.3	.8	1.8	2.3	3.1	4.0	4.6	6.8	7.5	9.5	12.0	4.7	3.5	2.46	
	61 62	50	.3	1.7	1.5	1.8	2.1	2.8	3.1	4.2	5.2	7.8	12.0	3.6	2.8	2.11	
ILLINOIS CICERO	62	19	.5	.5	.8	.9	1.8	2.0	2.0	2.7	4.0	7.8	9.6	2.8	1.9	2.47	
INDIANA INDIANAPOLIS	62	25	.3	.6	.7	.9	1.1	1.3	1.5	1.8	2.1	2.7	2.8	1.4	1.2	1.79	
MARYLAND BALTIMORE	61	26	.8	1.4	1.5	2.0	2.4	2.9	3.6	3.7	3.9	4.3	5.4	2.9	2.7	1.60	
	62	25	.4	.7	.9	1.0	1.1	1.3	1.5	1.7	1.8	3.8	4.8	1.6	1.4	1.75	
	61 62	51	.4	.9	1.1	1.3	1.5	1.8	2.4	3.0	3.7	4.0	5.4	2.3	2.0	1.83	
NEBRASKA OMAHA	59	21	.3	.9	1.8	2.1	2.6	3.5	4.0	4.6	5.2	8.9	29.0	4.8	3.2	2.52	
	62	25	.3	.7	.9	1.1	1.2	1.2	1.3	1.8	2.0	2.4	3.7	1.5	1.3	1.69	
	59 62	46	.3	.7	1.1	1.2	1.3	1.8	2.1	2.7	3.9	4.9	29.0	3.0	2.0	2.34	
NEW JERSEY NEWARK	62	26	.3	.5	.7	.9	1.0	1.3	2.1	2.4	3.1	3.4	4.1	1.8	1.4	2.07	
NEW YORK BUFFALO	62	24	.4	.5	.6	.7	.8	.9	1.1	1.3	1.5	2.7	10.0	1.8	1.1	2.22	
NORTH CAROLINA WINSTON SALEM	62	26	.3	.5	.6	.9	1.4	1.5	1.6	1.9	2.1	2.9	6.7	1.7	1.4	2.04	
OHIO CINCINNATI	60	23	1.0	1.6	2.1	2.7	2.9	3.5	3.8	4.6	6.8	8.9	26.0	3.4	3.0	2.16	
	62	24	1.1	1.1	1.4	1.8	2.0	2.1	2.2	2.7	3.5	15.0	29.0	4.7	2.9	2.44	
	60 62	47	1.0	1.3	1.8	2.0	2.2	2.7	3.0	3.8	7.3	11.5	26.0	5.0	3.3	2.31	
COLUMBUS	62	25	.4	.6	.7	1.0	1.1	1.3	1.4	1.8	1.9	2.1	2.3	1.4	1.2	1.63	
OKLAHOMA OKLAHOMA CITY	62	22	.3	.3	.4	.5	.6	.7	.7	.8	.9	1.0	1.7	.7	.7	1.50	
PENNSYLVANIA PHILADELPHIA	60	24	1.6	2.0	2.3	2.6	3.2	3.5	4.0	5.2	5.7	9.5	11.0	4.5	3.9	1.74	
	62	24	1.0	1.8	2.0	2.4	2.6	3.3	3.6	4.0	4.6	5.2	6.6	3.4	3.1	1.56	
	60 62	48	1.0	1.9	2.2	2.4	2.7	3.4	3.8	4.5	5.1	6.0	11.0	4.0	3.5	1.66	

TABLE 3-20. LEAD, FULL-YEAR DATA

Location Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev		
			Min	Frequency Distribution—Percent										Max		Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61	26	.4	.8	.9	1.1	1.8	2.0	2.1	2.2	2.8	4.1	6.3	2.3	1.9	1.95	
	62	24	.4	.5	.9	1.3	2.0	2.7	3.2	6.5	8.0	9.4	17.0	4.5	2.7	3.01	
	61 62	50	.4	.6	.9	1.3	1.8	2.1	2.6	3.2	5.1	8.0	17.0	3.4	2.2	2.49	
ILLINOIS CICERO	62	19	.2	.2	.2	.3	.4	.5	.6	1.5	2.0	2.2	2.8	1.0	.7	2.62	
INDIANA INDIANAPOLIS	62	25	.3	.3	.3	.4	.4	.6	.7	.8	.9	1.0	1.2	.7	.6	1.54	
MARYLAND BALTIMORE	61	26	.4	.4	.5	.7	.9	1.1	1.2	1.3	1.6	2.2	3.2	1.2	1.1	1.81	
	62	25	.3	.3	.4	.5	.6	.7	.7	.8	1.2	1.8	2.6	.9	.7	1.79	
	61 62	51	.3	.4	.5	.5	.7	.8	1.1	1.2	1.4	2.0	3.2	1.1	.9	1.84	
NEBRASKA OMAHA	59	21	.1	.2	.5	.8	.9	1.2	1.6	2.0	2.2	2.5	3.4	1.4	1.0	2.46	
	62	25	.3	.3	.4	.4	.5	.7	.8	1.0	1.1	1.5	1.8	.8	.7	1.70	
	59 62	46	.1	.3	.4	.5	.7	.8	1.0	1.2	1.6	2.1	3.4	1.1	.8	2.11	
NEW JERSEY NEWARK	62	26	.3	.5	.6	.7	.8	1.0	1.2	1.6	1.8	2.2	3.5	1.3	1.0	1.86	
NEW YORK BUFFALO	62	24	.1		.1	.1	.1	.1	.1	.2	.2	.4	.8	.2	.2	1.86	
NORTH CAROLINA WINSTON SALEM	62	26	.1	.1	.2	.3	.3	.4	.5	.5	.6	.9	1.9	.5	.4	2.01	
OHIO CINCINNATI	60	23	.4	.3	.4	.5	.5	.8	1.0	1.2	1.5	2.2	4.3	1.2	.9	2.05	
	62	24	.3	.3	.5	.7	.8	.9	1.0	1.3	1.6	2.2	3.4	1.2	1.0	1.88	
	60 62	47	.3	.4	.4	.5	.7	.8	1.0	1.3	1.6	2.1	4.3	1.2	.9	1.95	
COLUMBUS	62	25	.1	.1	.2	.2	.2	.3	.4	.5	.7	.9	4.4	.6	.4	2.26	
OKLAHOMA OKLAHOMA CITY	62	22	.2	.2	.2	.3	.3	.3	.4	.4	.5	.6	.9	.4	.4	1.49	
PENNSYLVANIA PHILADELPHIA	60	24	.2	.4	.6	.7	.8	1.2	1.6	2.0	2.2	4.9	6.1	1.8	1.3	2.36	
	62	24	.2	.4	.5	.7	1.0	1.1	1.5	1.8	2.9	3.1	4.3	1.6	1.2	2.27	
	60 62	48	.2	.4	.5	.7	.9	1.2	1.6	2.0	2.8	3.1	6.1	1.7	1.2	2.30	

TABLE 3-21. MANGANESE, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith. Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
CALIFORNIA LOS ANGELES	61	26	.02	.02	.02	.02	.03	.03	.04	.05	.07	.11	.04	.04	1.64			
	62	24		.01	.04	.04	.05	.05	.06	.10	.11	.14	.19	.07	.06	2.24		
	61-62	50		.01	.02	.03	.03	.04	.05	.06	.08	.11	.19	.06	.04	2.01		
ILLINOIS CICERO	62	19	.02	.02	.03	.03	.05	.06	.07	.13	.15	.24	.34	.10	.07	2.43		
INDIANA INDIANAPOLIS	62	25	.01	.02	.03	.04	.05	.06	.07	.09	.12	.14	.21	.07	.06	2.08		
MARYLAND BALTIMORE	61	26	.03	.03	.03	.04	.04	.08	.16	.21	.25	.27	.52	.14	.09	2.58		
	62	25	.02	.02	.03	.03	.03	.04	.04	.06	.11	.18	.72	.10	.06	2.42		
	61-62	51	.02	.02	.03	.03	.04	.05	.07	.13	.21	.27	.72	.12	.07	2.56		
NEBRASKA OMAHA	59	21		.01	.03	.04	.06	.09	.11	.13	.16	.18	.51	.11	.07	3.13		
	62	25	.01	.01	.02	.02	.03	.03	.04	.04	.05	.06	.15	.04	.03	1.88		
	59-62	46		.01	.02	.03	.03	.04	.05	.06	.12	.15	.51	.07	.05	2.63		
NEW JERSEY NEWARK	62	26	.01	.01	.01	.02	.03	.04	.04	.06	.07	.10	.14	.05	.04	2.32		
NEW YORK BUFFALO	62	24	.01	.03	.04	.06	.07	.10	.12	.15	.21	.50	.75	.17	.10	2.77		
NORTH CAROLINA WINSTON SALEM	62	26		.01	.02	.02	.03	.03	.04	.05	.05	.06	.19	.05	.04	2.27		
OHIO CINCINNATI	60	23	.03	.04	.05	.07	.12	.15	.18	.39	.34	1.08	1.80	.37	.18	3.32		
	62	24	.03	.04	.07	.09	.11	.13	.14	.17	.30	1.57	2.30	.43	.18	3.54		
	60-62	47	.03	.04	.06	.09	.12	.14	.16	.24	.57	1.48	2.30	.40	.18	3.19		
COLUMBUS	62	25		.01	.02	.03	.03	.04	.05	.06	.11	.13	1.30	.11	.05	3.19		
OKLAHOMA OKLAHOMA CITY	62	22			.01	.01	.01	.01	.02	.02	.02	.03	.04	.02	.02	1.65		
PENNSYLVANIA PHILADELPHIA	60	24	.03	.04	.05	.06	.08	.08	.09	.18	.30	.95	1.50	.27	.13	3.09		
	62	24	.06	.07	.09	.13	.14	.17	.19	.39	.57	1.02	1.30	.35	.23	2.51		
	60-62	48	.03	.05	.07	.08	.09	.14	.17	.21	.50	.95	1.50	.31	.17	2.87		

TABLE 3-22. NICKEL, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter											Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent													
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61	26	.016	.019	.021	.024	.027	.033	.038	.050	.065	.072	.150	.043	.036	1.77	
	62	24	.012	.017	.021	.022	.032	.035	.038	.070	.081	.105	.130	.049	.040	1.96	
	61 62	50	.012	.019	.021	.024	.030	.034	.038	.055	.071	.086	.150	.046	.038	1.85	
ILLINOIS CICERO	62	19	.006	.012	.015	.029	.030	.032	.032	.041	.065	.075	.110	.040	.032	2.05	
INDIANA INDIANAPOLIS	62	25	.006	.008	.009	.010	.014	.016	.022	.038	.065	.098	.150	.037	.023	2.62	
MARYLAND BALTIMORE	61	26	.015	.033	.038	.047	.054	.061	.068	.073	.147	.168	.230	.081	.065	1.94	
	62	25	.015	.019	.022	.027	.029	.046	.050	.065	.075	.098	.170	.052	.042	1.94	
	61 62	51	.015	.021	.027	.036	.045	.054	.062	.070	.086	.158	.230	.067	.053	2.00	
NEBRASKA OMAHA	59	21	.011	.011	.012	.014	.016	.017	.020	.022	.024	.025	.031	.018	.018	1.36	
	62	25	.006	.008	.009	.009	.010	.011	.011	.012	.014	.017	.019	.011	.009	1.99	
	59 62	46	.008	.009	.010	.011	.013	.015	.016	.019	.023	.031	.031	.014	.012	1.88	
NEW JERSEY NEWARK	62	26	.014	.038	.044	.057	.062	.070	.086	.094	.112	.192	.220	.088	.073	1.91	
NEW YORK BUFFALO	62	24	.007	.012	.015	.017	.019	.021	.023	.025	.029	.047	.053	.024	.022	1.59	
NORTH CAROLINA WINSTON SALEM	62	26	.007	.009	.011	.012	.017	.019	.022	.026	.029	.034	.017	.014	2.36		
OHIO CINCINNATI	60	23	.012	.015	.019	.021	.022	.024	.024	.026	.029	.036	.049	.025	.024	1.37	
	62	24	.010	.011	.013	.014	.016	.017	.019	.025	.029	.033	.038	.020	.019	1.49	
	60 62	47	.010	.012	.014	.017	.019	.021	.023	.026	.030	.034	.049	.023	.021	1.66	
COLUMBUS	62	25	.001	.010	.013	.017	.022	.026	.033	.038	.043	.051	.022	.014	3.89		
OKLAHOMA OKLAHOMA CITY	62	22	.005	.005	.005	.006	.006	.007	.007	.008	.010	.015	.020	.008	.008	1.45	
PENNSYLVANIA PHILADELPHIA	60	24	.024	.036	.047	.054	.070	.075	.086	.105	.128	.180	.330	.097	.079	1.87	
	62	24	.032	.035	.050	.055	.067	.071	.075	.105	.112	.134	.140	.079	.072	1.58	
	60 62	48	.024	.036	.048	.054	.067	.073	.090	.105	.117	.147	.330	.088	.076	1.73	

TABLE 3-23. TIN, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Max	Arith Mean	Geo Mean	Std Geo Dev
			Min	Frequency Distribution—Percent														
				10	20	30	40	50	60	70	80	90						
CALIFORNIA LOS ANGELES	61	26	.02	.02	.02	.03	.03	.04	.04	.04	.05	.05	.06	.04	.04	1.42		
	62	24	.02	.02	.03	.03	.04	.05	.05	.06	.07	.08	.18	.06	.05	1.72		
	61 62	50	.02	.02	.02	.03	.03	.04	.04	.05	.06	.07	.18	.05	.04	1.59		
ILLINOIS CICERO	62	19				.01	.01	.01	.01	.02	.02	.03	.06	.02	.01	2.07		
INDIANA INDIANAPOLIS	62	25						.01	.01	.01	.01	.01	.02		.01	1.52		
MARYLAND BALTIMORE	61	26					.01	.01	.01	.01	.02	.03	.05	.01	.01	2.13		
	62	25					.01	.01	.01	.01	.01	.03	.07	.01	.01	2.10		
	61 62	51					.01	.01	.01	.01	.02	.03	.07	.01	.01	2.12		
NEBRASKA OMAHA	59	21		.01	.01	.02	.02	.04	.05	.05	.06	.07	.08	.04	.03	2.20		
	62	25						.01	.01	.01	.01	.01	.02		.01	1.66		
	59 62	46				.01	.01	.01	.02	.02	.04	.06	.08	.02	.01	2.75		
NEW JERSEY NEWARK	62	26			.01	.01	.01	.02	.02	.03	.04	.05	.06	.02	.02	2.46		
NEW YORK BUFFALO	62	24						.01	.01	.01	.01	.01	.02		.01	1.67		
NORTH CAROLINA WINSTON SALEM	62	26						.01	.01	.01	.01	.01	.02		.01	1.46		
OHIO CINCINNATI	60	23	.03	.04	.05	.05	.06	.08	.08	.09	.09	.11	.16	.08	.07	1.51		
	62	24	.02	.02	.04	.05	.06	.07	.07	.08	.09	.11	.16	.10	.07	2.06		
	60 62	47	.02	.03	.04	.05	.06	.07	.08	.08	.09	.11	.16	.09	.07	1.79		
COLUMBUS	62	25						.01	.01	.01	.01	.01	.02		.01	1.45		
OKLAHOMA OKLAHOMA CITY	62	22						.01	.01	.01	.01	.01	.01		.01	1.17		
PENNSYLVANIA PHILADELPHIA	60	24	.03	.03	.05	.05	.06	.06	.06	.07	.09	.10	.12	.07	.07	1.45		
	62	24	.03	.03	.05	.06	.07	.07	.09	.10	.10	.11	.20	.08	.07	1.60		
	60 62	48	.03	.03	.05	.05	.06	.06	.07	.09	.10	.11	.20	.08	.07	1.53		

TABLE 3-24. TITANIUM, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter											Std Geo Dev		
			Min	Frequency Distribution—Percent									Max		Arith Mean	Geo Mean
				10	20	30	45	55	65	70	80	90				
CALIFORNIA LOS ANGELES	61	26	.04	.05	.06	.06	.07	.07	.08	.09	.11	.12	.34	.09	.08	1.58
	62	24	.01	.02	.04	.05	.09	.13	.14	.18	.22	.27	.34	.14	.10	2.51
	61 62	50	.01	.04	.05	.06	.07	.08	.10	.13	.17	.24	.34	.11	.09	2.05
ILLINOIS CICERO	62	19	.01	.01	.01	.01	.02	.02	.02	.03	.04	.06	.14	.03	.03	2.05
INDIANA INDIANAPOLIS	62	25			.01	.01	.01	.01	.01	.02	.02	.03	.06	.02	.02	1.74
MARYLAND BALTIMORE	61	26	.03	.04	.04	.05	.06	.08	.09	.09	.11	.12	.18	.08	.08	1.58
	62	25	.01			.01	.01	.01	.02	.02	.03	.04	.05	.02	.02	1.86
	61 62	51	.01		.01	.02	.03	.04	.05	.07	.09	.11	.18	.05	.04	2.53
NEBRASKA OMAHA	59	21	.01	.01	.03	.05	.05	.06	.07	.08	.11	.13	.37	.08	.06	2.35
	62	25				.01	.01	.01	.01	.01	.02	.02	.04	.01	.01	1.57
	59 62	46			.01	.01	.01	.02	.03	.05	.07	.09	.37	.04	.03	2.72
NEW JERSEY NEWARK	62	26	.01		.01	.01	.01	.02	.03	.03	.04	.05	.06	.03	.02	1.87
NEW YORK BUFFALO	62	24			.01	.01	.01	.01	.02	.02	.03	.06	.23	.03	.02	2.40
NORTH CAROLINA WINSTON SALEM	62	26	.01	.02	.03	.05	.06	.07	.09	.10	.11	.12	.18	.08	.06	2.00
OHIO CINCINNATI	60	23	.01	.01	.04	.07	.08	.10	.13	.16	.17	.20	.24	.11	.08	2.46
	62	24	.01	.01	.01	.02	.02	.02	.03	.05	.05	.07	.11	.04	.03	2.14
	60 62	47	.01	.01	.01	.02	.03	.05	.07	.09	.13	.17	.24	.07	.05	2.72
COLUMBUS	62	25				.01	.01	.01	.01	.02	.02	.02	.05	.02	.01	1.84
OKLAHOMA OKLAHOMA CITY	62	22						.01	.01	.01	.01	.01	.02	.01	.01	1.46
PENNSYLVANIA PHILADELPHIA	60	24	.02	.02	.03	.04	.06	.07	.09	.11	.14	.22	.49	.11	.07	2.37
	62	24	.01	.01	.02	.03	.03	.04	.05	.05	.06	.07	.18	.05	.04	1.92
	60 62	48	.01	.02	.02	.03	.04	.05	.06	.07	.10	.16	.49	.08	.06	2.25

TABLE 3-25. VANADIUM, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter												Std Geo Dev	
			Min	Frequency Distribution—Percent									Max	Arith Mean		Geo Mean
				10	20	30	40	50	60	70	80	90				
CALIFORNIA LOS ANGELES	61	26		.005	.007	.008	.008	.009	.014	.021	.025	.034	.100	.018	.012	2.70
	62	24	.004	.005	.012	.015	.021	.025	.030	.034	.038	.047	.130	.031	.022	2.35
	61 62	50		.005	.007	.008	.012	.017	.023	.029	.034	.040	.130	.024	.016	2.65
ILLINOIS CICERO	62	19	.004	.006	.007	.009	.011	.015	.020	.023	.029	.034	.055	.019	.015	2.10
INDIANA INDIANAPOLIS	62	25		.001	.001	.002	.003	.003	.004	.005	.006	.008	.011	.004	.003	2.86
MARYLAND BALTIMORE	61	26	.026	.080	.087	.124	.171	.257	.301	.325	.448	.618	1.000	.311	.216	2.54
	62	25	.028	.032	.036	.055	.062	.086	.106	.146	.159	.186	1.000	.130	.085	2.31
	61 62	51	.026	.034	.055	.081	.090	.146	.167	.236	.313	.526	1.000	.222	.137	2.71
NEBRASKA OMAHA	59	21					.001	.001	.001	.004	.004	.018	.049	.006	.002	4.94
	62	25					.001	.001	.001	.001	.001	.001	.003		.001	1.65
	59 62	46					.001	.001	.001	.001	.003	.004	.049	.003	.001	3.43
NEW JERSEY NEWARK	62	26	.021	.065	.090	.106	.146	.171	.189	.201	.277	.325	.600	.190	.151	2.07
NEW YORK BUFFALO	62	24	.005	.006	.010	.011	.012	.013	.013	.014	.015	.025	.037	.014	.013	1.56
NORTH CAROLINA WINSTON SALEM	62	26		.004	.005	.007	.007	.008	.009	.012	.013	.016	.025	.010	.008	2.11
OHIO CINCINNATI	60	23		.001	.004	.005	.006	.007	.008	.010	.011	.015	.030	.008	.006	2.98
	62	24			.001	.001	.003	.003	.004	.005	.007	.016	.003	.003	.002	3.57
	60 62	47		.001	.001	.004	.004	.005	.007	.010	.012	.030	.006	.003	.003	3.71
COLUMBUS	62	25						.001	.001	.001	.001	.001	.045	.002	.001	2.72
OKLAHOMA OKLAHOMA CITY	62	22											.000			
PENNSYLVANIA PHILADELPHIA	60	24	.056	.090	.159	.181	.301	.382	.426	.618	.810	.926	.990	.439	.326	2.32
	62	24	.039	.055	.090	.113	.124	.191	.244	.269	.301	.382	.610	.213	.169	2.08
	60 62	48	.039	.065	.115	.146	.186	.252	.301	.382	.487	.810	.990	.326	.235	2.34

TABLE 3-26. ZINC, FULL-YEAR DATA

Location: Region, State or Station	Years	Number of Samples	Micrograms Per Cubic Meter											Std Geo Dev			
			Min	Frequency Distribution—Percent											Max	Arith Mean	Geo Mean
				10	20	30	40	50	60	70	80	90					
CALIFORNIA LOS ANGELES	61	26		.01	.01	.47	.50	.57	.68	.76	.96	1.07	1.50	.59	.23	8.74	
	62	24			.01	.01	.64	.72	.78	.85	.90	1.65	1.80	.67	.19	11.36	
	61 62	50			.01	.46	.52	.64	.74	.83	.96	1.27	1.80	.63	.21	9.73	
ILLINOIS CICERO	62	19		.21	.34	.38	.45	.50	.53	1.07	1.51	3.02	4.60	1.16	.58	4.46	
INDIANA INDIANAPOLIS	62	25			.01	.01	.20	.23	.27	.38	.45	.90	1.20	.28	.08	8.77	
MARYLAND BALTIMORE	61	26		.25	.30	.38	.47	.53	.61	.66	.74	.90	2.20	.59	.39	3.95	
	62	25		.01	.24	.26	.27	.31	.34	.45	.64	.90	1.60	.41	.20	5.63	
	61 62	51		.01	.25	.28	.32	.42	.51	.62	.72	.90	2.20	.50	.28	4.84	
NEBRASKA OMAHA	59	21				.01	.01	.53	.64	.76	.83	.90	1.70	.47	.07	14.02	
	62	25					.01	.01	.01	.19	.23	.53	.83	.13	.02	7.89	
	59 62	46				.01	.01	.01	.19	.38	.70	.83	1.70	.29	.04	11.15	
NEW JERSEY NEWARK	62	26			.01	.23	.32	.38	.53	.90	1.39	2.13	4.60	.82	.20	11.06	
NEW YORK BUFFALO	62	24			.01	.01	.25	.27	.35	.50	.59	.83	1.90	.38	.12	8.58	
NORTH CAROLINA WINSTON SALEM	62	26			.01	.01	.24	.29	.33	.36	.42	.57	.75	.27	.10	7.76	
OHIO CINCINNATI	60	23		.01	.67	.96	1.07	1.27	1.51	1.96	2.34	7.16	17.00	2.56	1.06	6.51	
	62	24		.01	.50	.59	.72	.81	.90	1.17	1.51	4.26	15.00	2.05	.62	8.09	
	60 62	47		.01	.59	.78	.88	1.04	1.19	1.51	2.54	4.26	17.00	2.30	.81	7.27	
COLUMBUS	62	25				.01	.01	.01	.01	.38	.53	.64	1.60	.24	.03	10.64	
OKLAHOMA OKLAHOMA CITY	62	22						.01	.01	.01	.01	.01	.32	.02	.01	3.15	
PENNSYLVANIA PHILADELPHIA	60	24	.09	.53	.67	.73	.85	.99	1.39	2.13	3.21	5.55	8.20	1.95	1.24	2.71	
	62	24		.01	.50	.57	.76	.90	1.27	1.65	2.34	3.02	7.00	1.47	.62	7.40	
	60 62	48		.47	.57	.66	.79	.96	1.39	1.79	2.54	3.58	8.20	1.71	.88	4.97	

TABLE 3-27. ANTIMONY,
ABBREVIATED SUMMARY

Station Location	Years	Number of Samples		Maximum
		Collected	Above Detectable Quantity	
CALIFORNIA LOS ANGELES	61 62	26 24	- -	- -
ILLINOIS CICERO	62	19	2	.053
INDIANA INDIANAPOLIS	62	25	-	-
MARYLAND BALTIMORE	61 62	26 25	- 1	- .086
NEBRASKA OMAHA	59 62	21 25	- 2	- .048
NEW JERSEY NEWARK	62	26	-	-
NEW YORK BUFFALO	62	24	-	-
NORTH CAROLINA WINSTON SALEM	62	26	-	-
OHIO CINCINNATI	60 62	23 24	2 -	.062 -
OKLAHOMA OKLAHOMA CITY	62	25	-	-
PENNSYLVANIA PHILADELPHIA	60 62	24 24	3 3	.110 .998

TABLE 3-28. BISMUTH,
ABBREVIATED SUMMARY

Station Location	Years	Number of Samples		Maximum
		Collected	Above Detectable Quantity	
CALIFORNIA LOS ANGELES	61 62	26 24	1 -	.002 -
ILLINOIS CICERO	62	19	6	.005
INDIANA INDIANAPOLIS	62	25	1	.001
MARYLAND BALTIMORE	61 62	26 25	- 1	- .004
NEBRASKA OMAHA	59 62	21 25	4 6	.040 .016
NEW JERSEY NEWARK	62	26	2	.003
NEW YORK BUFFALO	62	24	4	.002
NORTH CAROLINA WINSTON SALEM	62	26	-	-
OHIO CINCINNATI	60 62	23 24	2 2	.006 .005
COLUMBUS	62	25	1	.002
OKLAHOMA OKLAHOMA CITY	62	22	-	-
PENNSYLVANIA PHILADELPHIA	60 62	24 24	6 -	.004 -

TABLE 3-29. COBALT,
ABBREVIATED SUMMARY

Station Location	Years	Number of Samples		Maximum
		Collected	Above Detectable Quantity	
CALIFORNIA LOS ANGELES	61 62	26 24	- -	- -
ILLINOIS CICERO	62	19	-	-
INDIANA INDIANAPOLIS	62	25	-	-
MARYLAND BALTIMORE	61 62	26 25	- -	- -
NEBRASKA OMAHA	59 62	21 25	- -	- -
NEW JERSEY NEWARK	62	26	-	-
NEW YORK BUFFALO	62	24	-	-
NORTH CAROLINA WINSTON SALEM	62	26	-	-
OHIO CINCINNATI	60 62	23 24	- -	- -
COLUMBUS	62	25	-	-
OKLAHOMA OKLAHOMA CITY	62	22	-	-
PENNSYLVANIA PHILADELPHIA	60 62	24 24	2 -	.009 -

TABLE 3-30. MOLYBDENUM,
ABBREVIATED SUMMARY

Station Location	Years	Number of Samples		Maximum
		Collected	Above Detectable Quantity	
CALIFORNIA LOS ANGELES	61 62	26 24	5 16	.02 .41
ILLINOIS CICERO	62	19	11	.18
INDIANA INDIANAPOLIS	62	25	4	.01
MARYLAND BALTIMORE	61 62	26 25	13 7	.05 .03
NEBRASKA OMAHA	59 62	21 25	1 -	.01 -
NEW JERSEY NEWARK	62	26	2	.01
NEW YORK BUFFALO	62	24	7	.02
NORTH CAROLINA WINSTON SALEM	62	26	1	.01
OHIO CINCINNATI	60 62	23 24	20 10	.07 .01
COLUMBUS	62	25	4	.01
OKLAHOMA OKLAHOMA CITY	62	22	-	-
PENNSYLVANIA PHILADELPHIA	60 62	24 24	22 15	.04 .02

TABLE 3-31. CHROMIUM, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14	.009	.027	.016
SAN FRANCISCO	62	13		.100	.029
	63	13		.020	.006
	62 63	26		.100	.018
COLORADO DENVER	62	13		.020	.008
	63	12		.028	.011
	62 63	25		.028	.009
DIST. OF COL. WASHINGTON	62	11		.022	.010
	63	13		.014	.005
	62 63	24		.022	.007
GEORGIA ATLANTA	62	12		.035	.020
	63	13		.014	.005
	62 63	25		.035	.012
ILLINOIS CHICAGO	62	13		.057	.009
	63	12		.028	.013
	62 63	25		.057	.011
LOUISIANA NEW ORLEANS	62	13		.033	.008
	63	13	.008	.017	.012
	62 63	26		.033	.010
MICHIGAN DETROIT	62	11		.022	.012
	63	13		.033	.012
	62 63	24		.033	.012
MISSOURI ST LOUIS	62	13		.065	.023
NEW YORK BUFFALO	63	13		.036	.014
	62	12		.066	.027
NEW YORK	63	12	.008	.042	.022
	62 63	24		.066	.025
OHIO CINCINNATI	63	13		.063	.016
	62	13		.035	.014
	63	12		.034	.022
	62 63	25		.035	.018
PENNSYLVANIA PHILADELPHIA	63	12		.030	.011
PITTSBURGH	62	13		.120	.046
	63	12		.049	.020
	62 63	25		.120	.033
WASHINGTON SEATTLE	63	12		.049	.013

TABLE 3-32. COPPER, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14	.05	.19	.10
SAN FRANCISCO	62	13	.01	.08	.04
	63	13	.01	.08	.03
	62 63	26	.01	.08	.03
COLORADO DENVER	62	13	.02	.43	.14
	63	12	.03	.23	.10
	62 63	25	.02	.43	.12
DIST. OF COL. WASHINGTON	62	11	.03	.09	.06
	63	13	.02	.09	.05
	62 63	24	.02	.09	.05
GEORGIA ATLANTA	62	12	.03	.08	.05
	63	13	.01	.18	.04
	62 63	25	.01	.18	.04
ILLINOIS CHICAGO	62	13	.03	.24	.12
	63	12	.02	.13	.07
	62 63	25	.02	.24	.10
LOUISIANA NEW ORLEANS	62	13	.02	.14	.05
	63	13	.01	.03	.02
	62 63	26	.01	.14	.04
MICHIGAN DETROIT	62	11		.07	.04
	63	13	.01	.23	.06
	62 63	24	.01	.23	.05
MISSOURI ST LOUIS	62	13	.04	.08	.06
NEW YORK BUFFALO	63	13	.03	.23	.10
	62	12	.02	.30	.13
NEW YORK	63	12	.05	.35	.17
	62 63	24	.02	.35	.15
OHIO CINCINNATI	63	13	.02	.17	.06
	62	13	.17	.35	.24
	63	12	.06	.44	.18
	62 63	25	.06	.44	.21
PENNSYLVANIA PHILADELPHIA	63	12	.02	.14	.06
PITTSBURGH	62	13	.04	.33	.15
	63	12	.03	.15	.08
	62 63	25	.03	.33	.12
WASHINGTON SEATTLE	63	12	.01	.05	.02

TABLE 3-33. IRON, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14	.5	4.3	1.2
SAN FRANCISCO	62	13		2.8	.8
	63	13	.1	.8	.4
	62 63	26		2.8	.6
COLORADO DENVER	62	13	1.0	5.8	2.8
63	12	.8	5.2	1.7	
	62 63	25	.8	5.8	2.3
DIST. OF COL. WASHINGTON	62	11	.5	2.8	1.7
63	13	.4	1.9	1.1	
	62 63	24	.4	2.8	1.3
GEORGIA ATLANTA	62	12	1.0	7.1	4.3
63	13	.1	2.1	1.1	
	62 63	25	.1	7.1	2.6
ILLINOIS CHICAGO	62	13	.6	7.0	2.0
63	12	.4	8.0	2.2	
	62 63	25	.4	8.0	2.1
LOUISIANA NEW ORLEANS	62	13	.4	2.6	.9
63	13	.2	.9	.6	
	62 63	26	.2	2.6	.8
MICHIGAN DETROIT	62	11	.2	2.5	1.6
63	13	.2	6.9	1.7	
	62 63	24	.2	6.9	1.6
MISSOURI ST LOUIS	62	13	1.1	8.6	2.8
NEW YORK BUFFALO	63	13	.3	3.6	1.3
NEW YORK	62	12	1.0	6.2	3.7
	63	12	.7	4.1	1.9
	62 63	24	.7	6.2	2.8
OHIO CINCINNATI	63	13	.4	4.2	1.7
CLEVELAND	62	13	.5	8.7	2.9
	63	12	.9	5.2	2.8
	62 63	25	.5	8.7	2.8
PENNSYLVANIA PHILADELPHIA	63	12	.9	4.3	1.8
PITTSBURGH	62	13	.9	11.0	4.5
	63	12	.5	3.8	2.2
	62 63	25	.5	11.0	3.4
WASHINGTON SEATTLE	63	12	.3	1.0	.6

TABLE 3-34. LEAD, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14	.3	2.9	1.1
SAN FRANCISCO	62	13	.3	3.3	1.0
	63	13	.1	1.6	.5
	62 63	26	.1	3.3	.7
COLORADO DENVER	62	13	.3	2.2	.9
63	12	.2	2.3	.7	
	62 63	25	.2	2.3	.8
DIST. OF COL. WASHINGTON	62	11	.4	3.3	1.2
63	13	.1	2.5	.8	
	62 63	24	.1	3.3	1.0
GEORGIA ATLANTA	62	12	.1	6.0	2.1
63	13	.3	2.4	.8	
	62 63	25	.1	6.0	1.4
ILLINOIS CHICAGO	62	13	.1	1.4	.6
63	12	.4	2.0	1.2	
	62 63	25	.1	2.0	.9
LOUISIANA NEW ORLEANS	62	13	.1	1.3	.5
63	13	.1	1.4	.5	
	62 63	26	.1	1.4	.5
MICHIGAN DETROIT	62	11	.4	3.5	1.2
63	13	.2	1.4	.5	
	62 63	24	.2	3.5	.8
MISSOURI ST LOUIS	62	13	.3	3.6	1.0
NEW YORK BUFFALO	63	13	.1	.4	.3
NEW YORK	62	12	1.0	6.0	1.8
	63	12	.4	3.0	1.8
	62 63	24	.4	6.0	1.8
OHIO CINCINNATI	63	13	.2	2.5	1.0
CLEVELAND	62	13	.2	1.6	.9
	63	12	.2	1.8	.9
	62 63	25	.2	1.8	.9
PENNSYLVANIA PHILADELPHIA	63	12	.3	2.5	1.0
PITTSBURGH	62	13	.2	7.3	1.4
	63	12	.1	1.8	.5
	62 63	25	.1	7.3	1.0
WASHINGTON SEATTLE	63	12	.1	1.4	.4

TABLE 3-35. MANGANESE, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		.07	.02
SAN FRANCISCO	62	13		.06	.02
	63	13		.03	.01
	62 63	26		.06	.02
COLORADO DENVER	62	13	.03	.12	.08
63	12		.02	.25	.06
	62 63	25	.02	.25	.07
DIST. OF COL. WASHINGTON	62	11	.02	.14	.06
63	13		.02	.08	.04
	62 63	24	.02	.14	.05
GEORGIA ATLANTA	62	12	.03	.70	.23
63	13		.01	.36	.11
	62 63	25	.01	.70	.17
ILLINOIS CHICAGO	62	13		.17	.06
63	12			.24	.09
	62 63	25		.24	.07
LOUISIANA NEW ORLEANS	62	13		.06	.03
63	13			.06	.02
	62 63	26		.06	.03
MICHIGAN DETROIT	62	11	.01	.45	.13
63	13		.01	.42	.14
	62 63	24	.01	.45	.14
MISSOURI ST LOUIS	62	13	.05	.42	.13
NEW YORK BUFFALO	63	13	.04	.43	.19
NEW YORK	62	12	.01	.11	.06
	63	12	.02	.12	.05
	62 63	24	.01	.12	.05
OHIO CINCINNATI	63	13	.01	.53	.16
CLEVELAND	62	13	.02	1.60	.27
	63	12	.03	.85	.27
	62 63	25	.02	1.60	.27
PENNSYLVANIA PHILADELPHIA	63	12	.03	1.60	.30
PITTSBURGH	62	13	.04	1.20	.35
	63	12	.02	.48	.19
	62 63	25	.02	1.20	.27
WASHINGTON SEATTLE	63	12		.09	.03

TABLE 3-36. MOLYBDENUM, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		.04	
SAN FRANCISCO	62	13		.00	
	63	13		.00	
	62 63	26		.00	
COLORADO DENVER	62	13		.12	.03
63	12			.04	.01
	62 63	25		.12	.02
DIST. OF COL. WASHINGTON	62	11		.01	
63	13			.00	
	62 63	24		.01	
GEORGIA ATLANTA	62	12		.01	
63	13			.00	
	62 63	25		.01	
ILLINOIS CHICAGO	62	13		.02	.01
63	12			.01	
	62 63	25		.02	.01
LOUISIANA NEW ORLEANS	62	13		.00	
63	13			.00	
	62 63	26		.00	
MICHIGAN DETROIT	62	11		.01	
63	13			.01	
	62 63	24		.01	
MISSOURI ST LOUIS	62	13		.04	.01
NEW YORK BUFFALO	63	13		.02	
NEW YORK	62	12		.02	.01
	63	12		.01	.01
	62 63	24		.02	.01
OHIO CINCINNATI	63	13		.01	
CLEVELAND	62	13		.02	.01
	63	12		.01	.01
	62 63	25		.02	.01
PENNSYLVANIA PHILADELPHIA	63	12		.01	
PITTSBURGH	62	13		.78	.11
	63	12		.19	.06
	62 63	25		.78	.09
WASHINGTON SEATTLE	63	12		.00	

TABLE 3-37. NICKEL, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		.089	.030
SAN FRANCISCO	62	13		.059	.018
	63	13	.006	.065	.021
	62 63	26		.065	.020
COLORADO DENVER	62	13	.002	.130	.039
	63	12	.004	.077	.026
	62 63	25	.002	.130	.033
DIST. OF COL. WASHINGTON	62	11	.013	.092	.032
	63	13	.008	.059	.033
	62 63	24	.008	.092	.033
GEORGIA ATLANTA	62	12		.026	.013
	63	13	.007	.022	.013
	62 63	25		.026	.013
ILLINOIS CHICAGO	62	13	.013	.058	.027
	63	12	.025	.190	.064
	62 63	25	.013	.190	.045
LOUISIANA NEW ORLEANS	62	13		.043	.017
	63	13		.028	.008
	62 63	26		.043	.013
MICHIGAN DETROIT	62	11		.034	.017
	63	13	.007	.070	.023
	62 63	24		.070	.020
MISSOURI ST LOUIS	62	13		.029	.019
NEW YORK BUFFALO	63	13	.016	.059	.030
NEW YORK	62	12	.068	.460	.146
	63	12	.087	.360	.180
	62 63	24	.068	.460	.163
OHIO CINCINNATI	63	13	.010	.037	.019
	62	13		.021	.004
	63	12	.007	.073	.032
	62 63	25		.073	.020
PENNSYLVANIA PHILADELPHIA	63	12	.026	.120	.041
PITTSBURGH	62	13		.058	.021
	63	17		.060	.019
	62 63	25		.060	.020
WASHINGTON SEATTLE	63	12	.012	.093	.043

TABLE 3-38. TIN, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		.04	.01
SAN FRANCISCO	62	13		.09	.03
	63	13		.01	
	62 63	26		.09	.02
COLORADO DENVER	62	13	.02	.07	.04
	63	12		.02	
	62 63	25		.07	.02
DIST. OF COL. WASHINGTON	62	11		.07	.04
	63	13		.03	.01
	62 63	24		.07	.02
GEORGIA ATLANTA	62	12	.02	.23	.07
	63	13		.03	.01
	62 63	25		.23	.04
ILLINOIS CHICAGO	62	13		.09	.05
	63	12		.06	.02
	62 63	25		.09	.04
LOUISIANA NEW ORLEANS	62	13	.02	.07	.04
	63	13		.05	.01
	62 63	26		.07	.03
MICHIGAN DETROIT	62	11		.06	.02
	63	13		.02	.01
	62 63	24		.06	.01
MISSOURI ST LOUIS	62	13	.02	.12	.07
NEW YORK BUFFALO	63	13		.02	.01
NEW YORK	62	12	.06	.17	.09
	63	12	.01	.09	.04
	62 63	24	.01	.17	.06
OHIO CINCINNATI	63	13		.12	.04
	62	13	.02	.08	.06
	63	12		.05	.03
	62 63	25		.08	.04
PENNSYLVANIA PHILADELPHIA	63	12		.04	.02
PITTSBURGH	62	13	.03	.11	.06
	63	12		.06	.01
	62 63	25		.11	.04
WASHINGTON SEATTLE	63	12		.01	

TABLE 3-39. TITANIUM, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14	.01	.15	.04
SAN FRANCISCO	62	13		.07	.02
	63	13		.01	.01
	62 63	26		.07	.01
COLORADO DENVER	62	13	.05	.17	.11
	63	12	.03	.23	.06
	62 63	25	.03	.23	.09
DIST. OF COL. WASHINGTON	62	11	.01	.05	.02
	63	13	.01	.04	.02
	62 63	24	.01	.05	.02
GEORGIA ATLANTA	62	12	.02	.21	.14
	63	13		.06	.02
	62 63	25		.21	.08
ILLINOIS CHICAGO	62	13	.01	.15	.04
	63	12	.01	.07	.02
	62 63	25	.01	.15	.03
LOUISIANA NEW ORLEANS	62	13		.03	.01
	63	13		.01	.01
	62 63	26		.03	.01
MICHIGAN DETROIT	62	11		.07	.02
	63	13	.01	.13	.03
	62 63	24		.13	.03
MISSOURI ST LOUIS	62	13	.02	.26	.08
NEW YORK BUFFALO	63	13		.08	.03
NEW YORK	62	12	.02	.15	.08
	63	12	.02	.11	.05
	62 63	24	.02	.15	.07
OHIO CINCINNATI	63	13	.01	.06	.03
	62	13	.01	.14	.06
	63	12	.02	.09	.05
	62 63	25	.01	.14	.06
PENNSYLVANIA PHILADELPHIA	63	12	.02	.08	.05
PITTSBURGH	62	13	.01	.06	.04
	63	12	.01	.12	.06
	62 63	25	.01	.12	.05
WASHINGTON SEATTLE	63	12		.03	.01

TABLE 3-40. VANADIUM, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		.048	.013
SAN FRANCISCO	62	13		.055	.009
	63	13		.043	.010
	62 63	26		.055	.009
COLORADO DENVER	62	13		.004	.001
	63	12		.010	.001
	62 63	25		.010	.001
DIST. OF COL. WASHINGTON	62	11	.007	.350	.095
	63	13	.033	.280	.105
	62 63	24	.007	.350	.100
GEORGIA ATLANTA	62	12		.018	.007
	63	13		.041	.006
	62 63	25		.041	.007
ILLINOIS CHICAGO	62	13	.004	.110	.035
	63	12	.008	.170	.064
	62 63	25	.004	.170	.049
LOUISIANA NEW ORLEANS	62	13		.054	.021
	63	13		.043	.013
	62 63	26		.054	.017
MICHIGAN DETROIT	62	11		.011	.005
	63	13	.003	.029	.008
	62 63	24		.029	.006
MISSOURI ST LOUIS	62	13		.007	.002
NEW YORK BUFFALO	63	13	.007	.040	.022
NEW YORK	62	12	.350	2.200	.736
	63	12	.230	1.000	.497
	62 63	24	.230	2.200	.617
OHIO CINCINNATI	63	13		.006	.002
	62	13		.013	.002
	63	12		.008	.004
	62 63	25		.013	.003
PENNSYLVANIA PHILADELPHIA	63	12	.057	.450	.185
PITTSBURGH	62	13		.048	.007
	63	12		.007	.004
	62 63	25		.048	.005
WASHINGTON SEATTLE	63	12	.004	.054	.020

TABLE 3-41. ZINC, SPECIAL STUDY,
PARTIAL YEARS

Station Location	Years	No. of Samples	$\mu\text{g}/\text{m}^3$		
			Minimum	Maximum	Average
CALIFORNIA LOS ANGELES	63	14		1.20	.25
SAN FRANCISCO	62	13		.81	.79
	63	13		.90	.09
	62 63	26		.90	.19
COLORADO DENVER	62	13		1.10	.54
	63	12		1.10	.27
	62 63	25		1.10	.41
DIST. OF COL. WASHINGTON	62	11		.71	.15
	63	13		.49	.16
	62 63	24		.71	.15
GEORGIA ATLANTA	62	12		12.00	3.52
	63	13		6.40	1.27
	62 63	25		12.00	2.35
ILLINOIS CHICAGO	62	13		4.00	.95
	63	12	.19	5.50	1.55
	62 63	25		5.50	1.24
LOUISIANA NEW ORLEANS	62	13		.00	
	63	13		.00	
	62 63	26		.00	
MICHIGAN DETROIT	62	11		1.80	.92
	63	13		1.20	.37
	62 63	24		1.80	.62
MISSOURI ST LOUIS	62	13		3.50	1.32
NEW YORK BUFFALO	63	13		1.80	.43
NEW YORK	62	12	.45	2.80	1.05
	63	12		2.00	.99
	62 63	24		2.80	1.02
OHIO CINCINNATI	63	13		5.40	1.53
CLEVELAND	62	13		2.70	.86
	63	12		1.90	.88
	62 63	25		2.70	.87
PENNSYLVANIA PHILADELPHIA	63	12		4.40	.94
PITTSBURGH	62	13		7.30	1.56
	63	12		3.70	.68
	62 63	25		7.30	1.14
WASHINGTON SEATTLE	63	12		.44	.07

TABLE 3-42. NITROGEN DIOXIDE, QUALIFYING STATIONS, 1963
(ppm in 24-hr samples)

STATION	NO OF SAMPLES	MIN	MAX	AVG
HARTFORD CONN	26	.02	.08	.05
NEW HAVEN CONN	23	.01	.09	.05
BOSTON MASSACHUSETTS	21	.03	.08	.05
PROVIDENCE RHODE ISLAND	23	.03	.12	.05
WILMINGTON DELAWARE	26	.03	.09	.05
NEWARK NEW JERSEY	24	.04	.11	.07
NEW YORK CITY NEW YORK	25	.03	.12	.07
BUFFALO NEW YORK	19	.02	.08	.05
PHILADELPHIA PA	23	.04	.12	.07
PITTSBURGH PA	25	.03	.12	.06
WASHINGTON D C	24	.04	.08	.06
BALTIMORE MARYLAND	26	.04	.10	.06
CHARLESTON WEST VIRGINIA	22	.02	.08	.05
CHATTANOOGA TENN	25	.02	.07	.05
NASHVILLE TENN	24	.01	.07	.04
CHICAGO ILLINOIS	24	.04	.07	.06
INDIANAPOLIS INDIANA	26	.03	.10	.05
DETROIT MICHIGAN	26	.03	.11	.05
CINCINNATI OHIO	25	.03	.08	.05
YOUNGSTOWN OHIO	26	.03	.08	.05
CLEVELAND OHIO	23	.03	.08	.05
DAYTON OHIO	25	.02	.06	.04
MILWAUKEE WISCONSIN	21	.01	.07	.04
DES MOINES IOWA	22	.01	.06	.03
WICHITA KANSAS	25	.02	.07	.03
MINNEAPOLIS MINNESOTA	24	.01	.05	.03
ST LOUIS MISSOURI	26	.02	.06	.04
DENVER COLORADO	23	.01	.09	.04
SALT LAKE CITY UTAH	22	.02	.08	.04
PORTLAND OREGON	24	.03	.14	.05
SEATTLE WASH	26	.03	.07	.04

* DENOTES VALUE LESS THAN .01 PPM

TABLE 3-43. NITROGEN DIOXIDE, NONQUALIFYING STATIONS, 1963
(ppm in 24-HOUR SAMPLE)

STATION	NO OF SAMPLES	MIN	MAX	AVG
SAN JUAN PUERTO RICO	16	.01	.05	.02
NORFOLK VIRGINIA	16	.03	.05	.04
BIRMINGHAM ALABAMA	15	.02	.13	.05
ATLANTA GEORGIA	16	.03	.08	.04
EAST CHICAGO INDIANA	11	.03	.05	.04
COLUMBUS OHIO	15	.03	.08	.05
KANSAS CITY MISSOURI	14	.01	.06	.03
NEW ORLEANS LOUISIANA	16	.03	.07	.05
ALBUQUERQUE NEW MEXICO	16	.02	.04	.03
TULSA OKLAHOMA	11	.02	.11	.05
HOUSTON TEXAS	13	.02	.07	.05
DALLAS TEXAS	13	.02	.07	.03
SAN ANTONIO TEXAS	13	.01	.06	.04
BOISE IDAHO	16	.02	.05	.03
PHOENIX ARIZONA	16	.01	.05	.03
LOS ANGELES CALIFORNIA	18	.01	.19	.09
SAN FRANCISCO CALIFORNIA	16	.03	.11	.05

* DENOTES VALUE LESS THAN .01 PPM

TABLE 3-44. SULFUR DIOXIDE, QUALIFYING STATIONS, 1963
(ppm in 24-hour samples)

STATION	NO OF SAMPLES	MIN	MAX	AVG
HARTFORD CONN	26	.01	.09	.03
NEW HAVEN CONN	23	.01	.13	.04
BOSTON MASSACHUSETTS	22	.01	.10	.03
PROVIDENCE RHODE ISLAND	22	*.00	.11	.05
WILMINGTON DELAWARE	26	.01	.13	.05
NEWARK NEW JERSEY	25	.01	.32	.08
NEW YORK CITY NEW YORK	25	.04	.38	.15
BUFFALO NEW YORK	19	*.00	.05	.02
PHILADELPHIA PA	25	.02	.27	.10
PITTSBURGH PA	25	.01	.12	.04
WASHINGTON D C	24	*.00	.08	.03
BALTIMORE MARYLAND	24	*.00	.09	.04
CHARLESTON WEST VIRGINIA	23	*.00	.04	.01
CHATTANOOGA TENN	25	*.00	.07	.01
NASHVILLE TENN	24	*.00	.05	.01
CHICAGO ILLINOIS	24	.01	.30	.11
INDIANAPOLIS INDIANA	26	*.00	.05	.02
DETROIT MICHIGAN	26	*.00	.07	.02
CINCINNATI OHIO	25	*.00	.06	.02
YOUNGSTOWN OHIO	26	.01	.10	.04
CLEVELAND OHIO	23	*.00	.10	.04
DAYTON OHIO	24	*.00	.04	.01
MILWAUKEE WISCONSIN	22	*.00	.03	.01
DES MOINES IOWA	24	*.00	.03	.01
WICHITA KANSAS	25	*.00	.01	*.00
MINNEAPOLIS MINNESOTA	24	*.00	.09	.02
ST LOUIS MISSOURI	26	*.00	.10	.02
DENVER COLORADO	23	*.00	.02	.01
SALT LAKE CITY UTAH	22	*.00	.04	.01
PORTLAND OREGON	24	*.00	.06	.02
SEATTLE WASH	26	*.00	.07	.02

* DENOTES VALUE LESS THAN .01 PPM

TABLE 3-45. SULFUR DIOXIDE, NONQUALIFYING STATIONS, 1963
(ppm in 24-hour samples)

STATION	NO OF SAMPLES	MIN	MAX	AVG
SAN JUAN PUERTO RICO	15	*.00	*.00	*.00
NORFOLK VIRGINIA	15	*.00	.04	.01
BIRMINGHAM ALABAMA	15	*.00	.05	.01
ATLANTA GEORGIA	16	*.00	.03	.01
EAST CHICAGO INDIANA	11	.01	.09	.04
COLUMBUS OHIO	15	*.00	.04	.01
KANSAS CITY MISSOURI	14	*.00	.11	.01
NEW ORLEANS LOUISIANA	16	*.00	.01	*.00
ALBUQUERQUE NEW MEXICO	17	*.00	.01	*.00
TULSA OKLAHOMA	11	*.00	.01	*.00
HOUSTON TEXAS	13	*.00	.01	*.00
DALLAS TEXAS	14	*.00	.01	*.00
SAN ANTONIO TEXAS	14	*.00	*.00	*.00
BOISE IDAHO	16	*.00	.02	*.00
PHOENIX ARIZONA	17	*.00	.01	*.00
LOS ANGELES CALIFORNIA	18	*.00	.01	*.00
SAN FRANCISCO CALIFORNIA	16	*.00	.01	*.00

* DENOTES VALUE LESS THAN .01 PPM

APPENDIX A - USE OF ARITHMETIC AND GEOMETRIC MEANS

ARITHMETIC MEAN

In the presentation of numerical data one seeks to find a value that is most representative of the entire set of data. Such a value is referred to as a measure of central tendency. The equation for computing the most commonly used measure of central tendency, the arithmetic mean (average), is

$$\bar{X} = \frac{1}{N} \sum_{i=1}^N X_i$$

where

$\bar{X}$ = the arithmetic mean.

N = the number of measurements.

$\sum_{i=1}^N X_i = X_1 + X_2 + \dots + X_N$, i.e., the sum of the N measurements.

GEOMETRIC MEAN

If the distribution of a set of numbers is approximately normal (the familiar bell-shaped curve), the arithmetic mean is an appropriate measure of central tendency. Studies of the distribution of measurements of particulate air pollutants tend to indicate, however, that a more suitable frequency function is that of the log-normal distribution. For this class of distributions, the logarithms of the actual measurements are approximately normally distributed. The measure of central tendency most appropriate for the log-normal distribution is the geometric mean given by

$$\bar{X}_g = [X_1 \cdot X_2 \cdot X_3 \dots X_N]^{\frac{1}{N}}$$

or more simply by

$$\bar{X}_g = \text{antilog} \left[\frac{1}{N} \sum_{i=1}^N \log X_i \right]$$

where

$\bar{X}_g$ = the geometric mean.

N = the number of observations.

$\sum_{i=1}^N \log X_i$ = the sum of the common logarithms of the measurements.

There are times when it is not plausible to assume that measurements of the concentration of a pollutant are log-normally distributed. In the absence of information about the exact nature of the underlying probability distribution of the data, the arithmetic mean is used as the measure of central tendency. Thus, in this report the arithmetic mean is used if either or both of the following were true:

- a. The number of samples collected during the year at the station did not meet the criterion for a representative sample (see Part 3).
- b. The concentration of the pollutant tended to be low and was in fact often below the minimum detectable quantity.

APPENDIX B: NASN STATION INVENTORY OF SAMPLE ANALYSES, 1957-1963

The following table summarizes the analyses of particulate and gaseous pollutants made on samples from each NASN station yearly from 1957 through 1963. The open circle, (○) indicates that 20 to 26 samples were collected in a given year and analyzed for suspended particulates and organic matter, and that the samples were collected with sufficient uniformity through the year to yield a representative sample for the year (see criteria for statistical analysis, Part 3). An asterisk * by the circle symbol indicates a State Network station, for which only suspended particulate data are available. The diagonal bars indicate sulfate and nitrate analyses (/) and metals analyses (\), respectively. A horizontal dash (—) indicates that some samples were collected during the year but they were too few (<20), or too sparse in certain months or seasons, to yield a valid statistical analysis, and the data have not been published. A blank square indicates that no samples were taken in that year, either because the station was not set up, or was not scheduled to sample. A triangle (△) indicates 20 to 26 samples of NO₂ and SO₂ were collected and analyzed. All published data appear either in references 2 or 3, or in this publication.

NOTE:

(1) Nonurban.

(2) 'Every Year' station.

(3) Quarterly composite metals analyses run for a few years.

* State network - particulate concentrations only.



Particulates and organics (20 to 26 samples per year).



Sulfates and nitrates.



Metals.



Number or distribution of samples invalid for statistical analysis.



NO₂ and SO₂.

Not scheduled.

		1957	1958	1959	1960	1961	1962	1963
ALABAMA,	(1) Baldwin Co.	—	○	○				
	(2) Birmingham	○	⊗	△	△	△	△	○
	Huntsville							○
	Mobile		○		○		○	
	Montgomery			○		○		○
ALASKA,	(2) Anchorage	○	⊗	○	○	○	○	○
	(1) Pt. Woronzof		○	○	○	○	⊗	○
ARIZONA,	(1) Grand Canyon Pk.	—	—	○	○	○	⊗	○
	(1) Maricopa Co.			—	○	○	○	○
	(2) Phoenix	○	⊗	⊗	⊗	○	△	○
	Tucson				⊗	⊗	○	○
ARKANSAS,	(2, 3) Little Rock	○	○	⊗	○	○	○	—
	(1) Montgomery Co.		—	○	○	○	○	○
CALIFORNIA,	(3) Berkeley			○		○	—	○
	Burbank	○			⊗		—	
	(3) Fresno		○		○		○	
	Glendale			○		○		○
	(1) Humboldt Co.		—	—	○	○	—	○
	(3) Long Beach		○			○		○
	(2) Los Angeles	⊗	⊗	⊗	⊗	⊗	⊗	○
	Monterey							—
	(3) Oakland		○		○	○	○	○
	Pasadena	○			○	—	⊗	
	(3) Richmond		○		○		○	
	(3) Sacramento		○		○		○	
	(3) San Bernardino	○		○		○	—	○

		1957	1958	1959	1960	1961	1962	1963
	(2, 3) San Diego	○	⊗	○	○	○	○	○
	(2, 3) San Francisco	○	⊗	○	○	⊗	⊗	○
	(3) San Jose	○		○				○
	Santa Barbara						⊗	○
	Stockton		○					○
COLORADO,	(2) Denver	○	⊗	○	○	○	⊗	⊗
	(1) Montezuma Co.		○	○	○	○	○	○
	Pueblo							○
CONNECTICUT,	Bridgeport		○		○		○	
	(2, 3) Hartford	○	⊗	○	○	○	⊗	⊗
	(1) Litchfield Co.		○	○				
	(3) New Britain			○		○		
	(2, 3) New Haven	○	⊗	○	○	○	⊗	⊗
	Norwich							○
	(3) Stamford	○			○		○	
	Waterbury		⊗			○		○
DELAWARE,	(1) Kent Co.		—	○	—	○	—	○
	(2, 3) Wilmington	○	⊗	⊗	⊗	○	○	○
DISTRICT OF COLUMBIA,	(2, 3) Washington	—	⊗	○	⊗	⊗	⊗	⊗
FLORIDA,	(1) Florida Keys	—	○	—	○	○	⊗	○
	(3) Jacksonville		○		○		○	
	(3) Miami	○		○		○		○
	(3) Orlando			○		○	○	○
	St. Petersburg					○	○	○
	(2) Tampa	○	⊗	○	○	○	○	○
GEORGIA,	(2) Atlanta	○	⊗	○	○	○	⊗	○
	(3) Augusta		○			○		○
	(1) Chatham Co.	—	○	○				
	(3) Columbus	○			○		○	
	(3) Macon		○		○		○	
	(3) Savannah			○		○		○

NOTE:

(1) Nonurban.

(2) 'Every Year' station.

(3) Quarterly composite metals analyses run for a few years.

* State network - particulate concentrations only.



Particulates and organics (20 to 26 samples per year).



Sulfates and nitrates.



Metals.



Number or distribution of samples invalid for statistical analysis.



NO₂ and SO₂.

Not scheduled.

		1957	1958	1959	1960	1961	1962	1963
HAWAII,	(1) Barbers Point, EWA			○	○			
	(2,3) Honolulu	⊗	○	○	○	○	○	○
	(1) Kahaluu			○	○	○	○	○
	(1) Waimanalo	○	—					
IDAHO,	(2,3) Boise	○	⊗	○	○	○	△	○
	(1) Butte Co.		○	○	○	○	○	○
ILLINOIS,	(2) Chicago	—	⊗	○	○	⊗	⊗	△
	Cicero						⊗	
	East St. Louis		○			○		○
	Joliet							○
	North Chicago							○
	(3) Peoria		○		—		○	
	Rockford			○		○		—
	(1) Sangamon Co.	—	○	○				
	Springfield	—			—		○	
INDIANA,	(2,3) East Chicago	○	⊗	○	○	○	○	○
	Evansville	○			○		○	
	Fort Wayne	○			○		○	
	Gary		○		⊗		○	
	(3) Hammond			⊗		○		○
	(2) Indianapolis	⊗	⊗	○	○	⊗	⊗	○
	Muncie							○
	(1) Parke Co.		○	—	○	○	⊗	○
	(3) South Bend			○		○		○
	Terre Haute		—			○		○
IOWA,	Cedar Rapids							○

		1957	1958	1959	1960	1961	1962	1963
KANSAS,	(3) Davenport		○			○		○
	(1) Delaware Co.		—	○	○	○	⊗	○
	(2) Des Moines	⊗	⊗	○	○	○	⊗	⊗
	(1) Ellis Co.	—	—					
	Kansas City	—			○		○	
	(3) Topeka			○		○		○
KENTUCKY,	(2) Wichita	⊗	⊗	○	○	○	⊗	⊗
	Lexington							—
	Louisville	—	—	—	—	○	—	—
LOUISIANA,	(1) Pulaski Co.							
	(3) Baton Rouge	○			○		○	
	Lake Charles						○	
	(2) New Orleans	○	⊗	○	○	⊗	⊗	○
	(3) Shreveport			○		○		—
MAINE,	(1) St. Tammany Parish			○				
	(1) Arcadia Nat. Park	—	○	○	○	○	⊗	○
	(2,3) Portland	—	○	○	○	○	○	○
MARYLAND,	Annapolis	—					△	△
	(2) Baltimore	⊗	⊗	⊗	⊗	⊗	⊗	⊗
	(1) Calvert Co.	—	—	○	○	○	⊗	○
	Cumberland							○
	Fort Howard						○	○
	Hagerstown						○	○
	Riviera Beach							○
	Rockville						○	○
	Westminister						○	
	(2) Boston	○	⊗	○	○	⊗	⊗	⊗
MASSACHUSETTS,	(3) Brockton		○	⊗	○	○	○	
	(3) Cambridge			○	○	○	—	
	(3) Fall River		○	—	○	○	○	
	Lawrence	○			○	○	○	

NOTE:

(1) Nonurban.

(2) 'Every Year' station.

(3) Quarterly composite metals analyses run for a few years.

* State network - particulate concentrations only.



Particulates and organics (20 to 26 samples per year).



Sulfates and nitrates.



Metals.



Number or distribution of samples invalid for statistical analysis.



NO₂ and SO₂.

Not scheduled.

	1957	1958	1959	1960	1961	1962	1963
(3) Lowell			○	—	○		○
Lynn	○			○	○	○	
(1) Nantucket		○	○				
(3) New Bedford			○	○	○	—	
(3) Quincy		○	⊗	○	○	○	
Somerville	○			○	○	○	
Springfield		○	⊗	○	○	○	
(2,3) Worcester	○		○	○	○	○	○
MICHIGAN, (3) Dearborn			○		○		○
(2) Detroit	○	⊗	○	△	△	△	△
(3) Flint	○		○		—		○
Grand Rapids	—		—			○	○
(1) Huron Co.	○	○	○				
(3) Jackson		○			○		○
Kalamazoo	○			○		○	
(3) Lansing	○			○		○	
Muskegon							○
(3) Saginaw		○		○		○	
MINNESOTA, (1) Cook Co.	—	○	○				
Duluth	○		○		○	—	○
(2) Minneapolis	○	⊗	⊗	○	○	△	△
St. Paul		○		○	○	○	○
MISSISSIPPI, (2,3) Jackson	○	⊗	○	○	○	○	○
(1) Jackson Co.	—	○	○	○	○	○	○
MISSOURI, (2) Kansas City	○	⊗	○	○	○	○	○
(1) Shannon Co.	—	○	○	—	○	○	○

		1957	1958	1959	1960	1961	1962	1963
	(2) St. Louis	○	⊗	○	○	⊗	⊗	⊗
MONTANA,	Anaconda					○		
	Billings					○		
	Butte					○		
	(1) Glacier Nat. Park		○	○	○	○	⊗	○
	Great Falls						○	
	(2) Helena	○	⊗	○	○	○	○	○
	Libby						○	
	Missoula						○	
NEBRASKA,	Lincoln	○			○		○	
	(2, 3) Omaha	○	⊗	⊗	○	⊗	⊗	○
	(1) Thomas Co.	—	○	○	○	○	○	○
NEVADA,	(2, 3) Las Vegas	○	⊗	—	○	⊗	○	○
	Reno							○
	(1) White Pine Co.		—	○	○	○	○	○
NEW HAMPSHIRE,	(1) Coos Co.			○	○	○	○	○
	Manchester	—	⊗	○	○	○	—	
NEW JERSEY,	(3) Atlantic City		○			○		○
	Bayonne			—				○
	Camden	○			○		○	
	(1) Cape May		—	—				
	East Orange	○			○		○	
	Elizabeth		○		○		○	
	Hamilton							○
	(3) Jersey City	○		○		○		○
	(2, 3) Newark	—	○	⊗	○	⊗	⊗	⊗
	Paterson			—		—		○
	Trenton		—		—		○	
NEW MEXICO,	(2, 3) Albuquerque	○	⊗	○	⊗	○	⊗	○
	(1) Colfax Co.		—	○	○	○	○	○
NEW YORK,	Albany		—		○	○	○	⊗

NOTE:

(1) Nonurban.

(2) 'Every Year' station.

(3) Quarterly composite metals analyses run for a few years.

* State network - particulate concentrations only.



Particulates and organics (20 to 26 samples per year).



Sulfates and nitrates.



Metals.



Number or distribution of samples invalid for statistical analysis.



NO₂ and SO₂.

Not scheduled.

	1957	1958	1959	1960	1961	1962	1963
(2) Binghamton	○	—	○	○	○	○	○
Buffalo	—	—	○	○	○	—	○
(1) Cape Vincent		—	—	○	○	○	○
Elmira			○	○	○	○	
Glen Cove			○	○	○	○	—
Massena			○	○	○	○	○
Mt. Vernon				—	○	—	○
New Rochelle			○	○	○	—	○
(2) New York	○	○	○	△	△	△	△
Niagara Falls			○	—	○	—	○
(2) Rochester		○	○	○	○	○	○
Schenectady	○		○	○	—		○
(2) Syracuse	○		○	○	○	○	○
Troy			○	○	○	○	○
(2) Utica	○		○	○	○	○	○
Yonkers		—	—				
NORTH CAROLINA, Asheville		○		○		○	
(1) Cape Hatteras	—	○	○	○	○	○	○
(2) Charlotte	○	○	○	○	○	○	○
Durham							○
Gastonia							○
(3) Greensboro		○			○		○
(3) Raleigh			○		○		○
Wilmington						△	△
(3) Winston Salem	○			○		○	
NORTH DAKOTA, (2) Bismarck	○	○	○	○	○	○	○

OHIO,

- (1) Ward Co.
Akron
(3) Canton
(2) Cincinnati
(2) Cleveland
(2,3) Columbus
(2) Dayton
(3) Hamilton
(3) Lorain
(1) South Bass Island
(3) Springfield
(3) Toledo
(2,3) Youngstown

OKLAHOMA,

- (1) Cherokee Co.
(3) Oklahoma City

Tulsa

OREGON,

- (1) Curry Co.
Eugene
Medford

- (2) Portland

PENNSYLVANIA,

- Allentown
Altoona
Bethlehem

- (1) Clarion Co.

Erie

- (3) Harrisburg

- (3) Johnstown

Lancaster

- (2) Philadelphia

- (2) Pittsburgh

- (3) Reading

1957	1958	1959	1960	1961	1962	1963
—	○	○	○	○	○	○
	○		⊗	○	○	○
○		○		⊗	—	○
○	⊗	○	⊗	⊗	△	△
⊗	⊗	○	○	○	△	△
○	⊗	○	○	⊗	⊗	○
	○	○	⊗	△	△	△
		○		○		○
○			○		○	
—	—	○				
	○		○		○	
○		○		—	○	○
⊗	⊗	○	⊗	△	△	△
			○	○	○	○
	○		○	⊗	⊗	—
○	—	○	—	△	△	○
	○	○	—	—	○	○
				⊗		○
○	⊗	○	○	△	△	△
	—	○		⊗		○
		—		—		○
				⊗		○
	○	○	○	○	⊗	○
		—		○	—	○
	○		○		○	
—		○		○		○
—			—		○	
○	⊗	⊗	△	⊗	⊗	△
○	⊗	⊗	⊗	△	⊗	△
	○		○		○	

NOTE:
 (1) Nonurban.
 (2) 'Every Year' station.
 (3) Quarterly composite metals analyses run for a few years.
 * State network - particulate concentrations only.

○ Particulates and organics
 (20 to 26 samples per year).
 / Sulfates and nitrates.
 \ Metals.
 — Number or distribution of samples invalid for statistical analysis.
 Δ NO₂ and SO₂.
 Not scheduled.

		1957	1958	1959	1960	1961	1962	1963
	(3) Scranton	○		○		⊗		○
	(3) Wilkes-Barre		○		○		○	
	(3) York			○		○		○
PUERTO RICO,	(1) Loquillo Mtns.		—	○	○	○	—	—
	(3) San Juan	○	—	○	○	○	Δ	—
RHODE ISLAND,	East Providence							○
	(2, 3) Providence	○	⊗	○	○	○	Δ	Δ
	(1) Washington Co.		—	○	○	○	○	○
SOUTH CAROLINA,	(3) Charleston			○		○		○
	(2, 3) Columbia	○	⊗	—	○	○	○	○
	(3) Greenville	○			○		○	
	(1) Richland Co.			○	○	○	○	○
SOUTH DAKOTA,	(1) Black Hills Frst.	—	○	—	—	—	○	○
	(2, 3) Sioux Falls	○	⊗	○	○	○	○	○
TENNESSEE,	(2, 3) Chattanooga		⊗	⊗	○	⊗	Δ	Δ
	(3) Knoxville	○		○		○		○
	(3) Memphis		○		○	○	○	○
	(2) Nashville	⊗	⊗	○	○	○	Δ	Δ
	(1) Stewart County	—	—	○				
TEXAS,	Abilene						○	○
	Amarillo						○	○
	(1) Aransas Co.						○	○
	(3) Austin	○				○	○	○
	(3) Beaumont			○		○	○	—
	(1) Calhoun Co.		—	—	—	—		
	Corpus Christi	○			○	○	○	○

		1957	1958	1959	1960	1961	1962	1963
	(2) Dallas	○	⊗	—	○	○	△	○
	El Paso	○			○	○	○	○
	(3) Ft. Worth		○		○	○	○	○
	(3) Galveston			○		○	○	○
	Harlingen						○	
	(2) Houston	○	⊗	⊗	△	△	△	○
	Lubbock						○	○
	Odessa							○
	San Angelo						○	○
	(2) San Antonio	○	⊗	○	○	○	△	○
	(3) Texas City			○		○	○	
	Tyler							○
	(3) Waco		○		○	○	○	○
	Wichita Falls						○	○
UTAH,	(1) Bryce Canyon Pk.		○	○				
	(2) Salt Lake City	○	⊗	○	○	○	△	△
VERMONT,	(2,3) Burlington	○	⊗	○	○	○	○	○
	(1) Lamoille Co.		—					
	(1) Orange Co.				○	○	○	○
VIRGINIA,	Danville			—	○		○	
	(3) Hampton		○		○	○		○
	Lynchburg							—
	(2,3) Norfolk	⊗	⊗	○	○	○	△	○
	Portsmouth					○	—	○
	(3) Richmond	○		○		○		○
	Roanoke			○		○	—	○
	(1) Shenandoah Park	—	○	○	○	○	⊗	○
WASHINGTON,	Bellingham						○	○
	(1) Clallam Co.		—	—	—	○	—	○
	Clarkston						—	○
	Everett						○	○

(1) Nonurban.

(3) Quarterly composite metals analyses

run for a few years.

* State network - particulate concentrations only.

Particulates and organics
(20 to 26 samples per year).

Sulfates and nitrates.

Metals.

Number or distribution of samples
invalid for statistical analysis.

NO₂ and SO₂.

Not scheduled.

[illegible]

REFERENCES

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The states of Maryland, New York, North Carolina, Texas, and Washington have contributed data from their own air sampling networks for inclusion in this report. It is hoped that such contributions will increase in future years, thus further expanding the available body of information on urban air quality.